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Original Communications.

A CASE OF TOTAL LARYNGECTOMY (UNSUCCESSFUL) AND A CASE OF ABDOMINAL HYSTERECTOMY (SUCCESSFUL), IN BOTH OF WHICH MASSAGE OF THE HEART FOR CHLOROFORM COLLAPSE WAS EMPLOYED, WITH NOTES OF 25 OTHER CASES OF CARDIAC MASSAGE.

BY W. W. KEEN, M.D., LL.D., F.R.C.S. (HON.),
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A fatal result during an operation is so rare that such cases should be reported, together with the means employed for resuscitation of the patient, especially when the means are novel. On only three occasions in my entire professional life have I been so unfortunate as to have a patient die on the table. The first two were respectively cases of operation on the brain and goitre. In both of these cases hemorrhage was the cause of death, and all the usual means were unavailing.

The third case of death on the table and the first case of massage of the heart here reported is of more than usual interest not only on account of the method employed for resuscitation, though, unfortunately, it was unavailing, but because of the prior fracture of the skull with entire recovery from mental as well as physical symptoms.

The notes of the second case have been kindly sent me by Dr. Kristian Igelsrud, of Tromsö, Norway. He was present when I operated upon the first case, and as I was greatly interested in the account

of his own case, I requested him to let me have the notes for publication, which he has kindly done.

CASE I (KEEN).—*Fracture of the skull followed by aphasia and partial loss of word memory; trephining; restoration of speech; recurrent hoarseness; development of squamous epithelioma of both vocal chords; unilateral laryngectomy; recovery; total laryngectomy; death from chloroform collapse; ineffectual attempt to restore life by massage of the heart.*

The patient, John H., was first seen December 13, 1902, at the instance of Dr. Charles E. McGirk of Phillipsburg, Pa., and Drs. B. Alex. Randall and Walter J. Freeman of this city. These gentlemen furnished me with the following facts: Prior to the accident about to be described he had always enjoyed good health, and had never suffered from hoarseness or any other trouble with his speech. In 1900, about two years before I saw him, he was struck on the left side of the head by a piece of paving brick thrown by accident, causing a fracture of the skull. Dr. McGirk writes me that his father, Dr. J. D. McGirk, saw him about twenty minutes after the accident, found him partially conscious, but unable to speak, and made the remark that he was drunk. The patient, however, by signs conveyed to Dr. McGirk that he wanted paper and pencil, and upon this being furnished, he wrote that he was not drunk, but had been hit with a brick on the head. Dr. Charles E. McGirk saw him the next day, "when he could articulate words with great difficulty, and was suffering from motor aphasia and partial loss of word memory. He was unable to say many words, especially those beginning with 'b,' even after repeated trials. He would be talking and stop in the middle of a sentence, unable to proceed for some seconds on account of his inability to speak the remaining words, but knowing perfectly what he wished to say. Finally memory returned to him and he would complete the sentence. Along with this disturbance of speech slight hoarseness appeared, but about two months after the accident the hoarseness disappeared while the aphasia still remained." Dr. McGirk believes that the temporary hoarseness immediately after the accident was due to partial paralysis of the vocal chord, and that this may have had some influence in the later carcinomatous development.

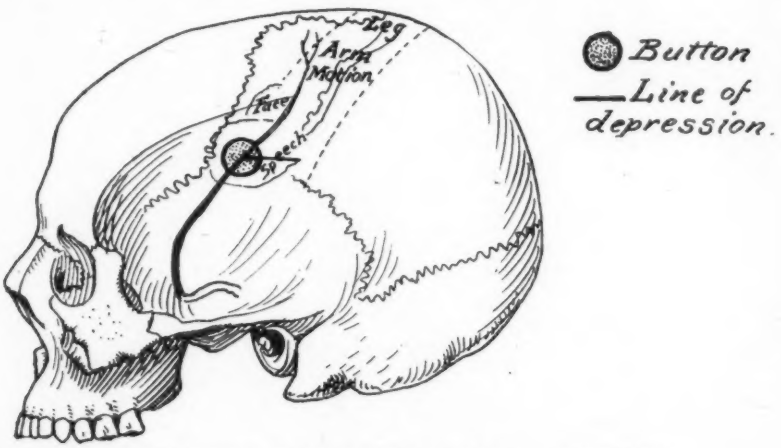

FIG. 1.—Showing the line of depression and the site of the button of bone removed (McGirk).

"Some time prior to September, 1902, probably in June or July, hoarseness reappeared, and from this time the hoarseness became gradually worse, though it never caused him any dyspnea."

In September, 1902, the patient again consulted Dr. Chas. E. McGirk, who found a marked depression at the site of the old injury, and on October 3, 1902, trephined and removed the depressed bone (Figs. 1 and 2). Dr. McGirk reports that "the depression extended from before backward and was about one and a half inches in length, the deepest depression being about its middle, and extended over the lower portion of the anterior and posterior central convolutions. The inner

surface shows the groove for the middle meningeal artery and also the fractured inner surface. The external surface shows a very marked depression of the skull. He was anesthetized with ether and oxygen. He took the anesthetic with great difficulty, and was cyanotic to a greater or less degree during the entire operation." He made an uneventful convalescence; word memory returned in two weeks, but his hoarseness remained, as well as soreness, which had become worse within the prior four or five weeks. Finding that the throat condition was growing worse, with marked dyspnea, Dr. McGirk had him consult Dr. Randall December 4, 1902, and Dr. Randall asked Dr. Freeman to see him. They examined the larynx

FIG. 2.—Photograph of the button of bone. The left-hand figure shows the external surface and the depression caused by the blow. The right-hand figure shows (by a mirror) the internal surface, the fracture and depression of the bone, and the groove for the middle meningeal artery.

carefully and determined that "the rough, enlarged left vocal chord extended beyond the middle line and presented outgrowths, which are almost certainly epitheliomatous. There is little evidence of glandular involvement" (Randall). It was impossible to see the anterior portion of the right chord. They advised an operation—a unilateral laryngectomy if this would seem to promise relief, or total laryngectomy should the operation show its necessity.

Dyspnea was a very prominent symptom, and was so great that, as Dr. Randall pointed out, if exposure to the weather or any other cause should produce any slight increase in the obstruction to breathing, an instant tracheotomy would have to be done. This would be extremely difficult. The man weighed nearly 200 pounds, his neck was short and thick, and the trachea, of course, was very deeply situated.

First operation, unilateral laryngectomy, December 16, 1902. Drs. McGirk, Randall, and Freeman were kindly present. Drs. Stewart and Craig assisted me at the operation, and Dr. Spencer gave the anesthetic. In view of Dr. McGirk's experience with the anesthetic at the former operation and of the existing excessive dyspnea, I feared that a general anesthetic would cause such sudden increase of dyspnea from spasm that instantaneous tracheotomy would be necessary. I decided, therefore, to operate under local anesthesia until I could split the thyroid, and by opening it widely determine whether unilateral or complete laryngectomy would have to be done. This plan was carried out, the patient being in the Trendelenburg position. He suffered but little pain, but as soon as the larynx was widely open began to cough so constantly and violently that it was very difficult to make any accurate observation. Finally, however, we were able to ascertain clearly that the entire left vocal chord was diseased, and that a very small part of the anterior end of the right vocal chord undoubtedly was thickened, and I suspected a beginning disease there. On consultation, however, we deemed that unilateral laryngectomy, together with removal of the anterior end of the right chord, would be a sufficiently radical operation. Accordingly I removed, first, the anterior portion of the right chord without trouble. On attempting to separate the soft parts on the left side of the larynx from the thyroid cartilage, he felt so much pain in spite of the local anesthesia that I decided to give him some chloroform. This was done by means of the von Esmarch mask over the mouth and nose, with an additional piece of gauze over the laryngeal opening. He struggled a great deal. It was impossible to get him quieted with the chloroform sufficiently to go on with the operation without producing such cyanosis as to render Dr. Spencer and myself very anxious. The partial laryngectomy, however, was finally effected under very great difficulties; part of the time he was struggling and part of the time, though quiet, he was cyanotic. I then placed a tracheotomy tube above the cricoid and closed the wound. He made a perfectly smooth and good recovery in spite of the fact that the wound necessarily communicated with the fluids of the mouth. Prior to the operation, and also

during convalescence, the mouth, nose, and laryngeal wound had been sprayed with hot listerine and boric acid every two hours while he was awake. His temperature only rose above 99° for two days, the fourth and fifth, and it reached 99.8° on one occasion only. The tracheotomy tube was removed on the fifth day, and he went home on the seventh day after the operation, the wound being almost healed.

Professor Coplin, to whom the specimens were given for examination, pronounced the disease a squamous epithelioma not only of the left chord, but also beginning to involve the right chord. Naturally, therefore, I looked forward with a great deal of anxiety to his future.

About the 20th of January, 1903, his dyspnea returned and rapidly increased. On the afternoon of February 4 he returned to the city, his dyspnea being so great that his wife was afraid he would die on the train. He was able, however, to wait until February 6, the earliest date at which it was possible for me to do the operation.

Second operation, total laryngectomy, February 6. Anticipating the possibility of an instantaneous tracheotomy, chloroform and oxygen were given him, but not until he was upon the operating table. He was then placed in the Trendelenburg position, and I did a very low tracheotomy, but with a great deal of difficulty, because again, as before, when a moderate amount of chloroform was given he struggled, and when enough was given to keep him quiet he became so cyanosed as to make me very anxious even for his life. As soon as the tracheotomy was done, chloroform was given through a tube which was connected with a long rubber tube and the inhaler (Trendelenburg's apparatus). The larynx was then dissected out, the trachea divided at the first ring below the cricoid, and the entire remaining portion of the laryngeal box was removed. The hemorrhage gave a considerable amount of trouble, but was finally checked. I then sewed the anterior wall of the pharynx to the tissues around the hyoid bone and the upper end of the trachea to the skin. Just as I finished suturing the parts and was ready to close the wound, his pulse suddenly failed and his face became very blue. The operation and the administration of the chloroform were immediately stopped, pure oxygen was administered, 1/20 of a grain of strychnine was given hypodermically, artificial respiration was instituted with rhythmical traction upon the tongue (although I doubted whether, in the absence of the larynx, this would be of any value), and the battery was applied over the phrenic. In spite of all of this his heart continued to beat much faster and weaker, he became more cyanotic, and in two to three minutes the heart ceased beating and he was dead. After continuing the above means as nearly as I could judge for ten minutes, as a last resort I opened the upper abdomen, introduced my hand into the abdominal cavity, and between this hand and the right hand, which made counterpressure on the anterior wall of the chest, I masséed the heart. These efforts were continued for nearly half an hour, but without avail.

Examination of the specimen by Professor Coplin and Dr. A. G. Ellis confirmed the diagnosis of epithelioma.

CASE II (IGELSRUD).—*Abdominal hysterectomy; chloroform collapse; massage of the heart; recovery.* Dr. Igelsrud calls attention to the fact that the case is not entirely convincing, for the ordinary means for resuscitation were only tried for three to four minutes, and also traction on the tongue was employed during massage of the heart. He states, however, his personal belief that the massage of the heart was the most effectual of all the means employed. (He has not given me the date of the operation, but it was prior to 1902, probably in 1901.)

"A thin, lean, rather cachectic woman, aged forty-three, with cancer of the uterus. Total abdominal hysterectomy was performed. When the operation was almost finished the patient passed into collapse; artificial respiration, lowering of the upper portion of the bed, faradization, and the other usual means were used for about three to four minutes. The heart was then laid bare by a resection of parts of the fourth and fifth ribs. The pericardium was opened and the heart seized between the thumb and fore and middle fingers on the anterior and posterior surfaces. Quite strong and rhythmical pressure was made for about one minute, when the heart began to pulsate of itself. Then observing that the pulsations were becoming weaker, massage of the heart was practiced for

about one minute more. From that time the pulse was perceptible and the contractions of the heart became regular. Of course the estimate of time of the various stages is only approximate, as accurate observation of a timepiece is impossible under such circumstances. The patient was discharged from the hospital after five weeks."

REMARKS.

The physiologists led the way in efforts to reëstablish the pulsation of the heart, Schiff in 1874 being the first to succeed by means of rhythmical compression of the ventricles by the hand. At first defibrinated blood was injected, but later various artificial fluids more or less resembling blood in their dissolved salts and specific gravity have given even better results. Finally the addition of 1 per cent of grape-sugar added to Locke's fluid was found to be the most desirable means.

The earlier experiments were made upon the heart retained in the body, but later hearts removed from the body even for a long time and even after being frozen were more or less successfully resuscitated. Not only was the effect of filling the heart with fluid tried, but direct massage of that organ was used.

In 1889 Prus, of Lemberg (*Wiener klin. Wochenschrift,* 1900, Nos. 20 and 21), made a new series of experiments upon dogs. He experimented upon forty-four dogs killed by asphyxia, twenty-one by chloroform, and thirty-five by electricity. His attempts to resuscitate them were sometimes begun as late as an hour after the heart had ceased to contract. He then seized the heart laid bare *in sutu* with the right hand, the thumb being applied on the right ventricle, and the other fingers on the left ventricle, when he instituted rhythmical movements. Out of the 100 experiments he was successful in reëstablishing contractions of the heart forty-seven times in a wholly normal manner after efforts varying from fifteen seconds to two hours, and eight times incompletely.

In 1900 Batelli (*Jl. de Physiol. et de Pathol. Gén.,* 1900, p. 443) made further studies in the same direction. He was able to recall to life several dogs. Both he and Prus advocated the application of the method to man in case of cardiac arrest from chloroform asphyxia.

Kuliabko (*Arch. Gesammte Physiol.,* 1902, vol. xc, p. 461) established artificial circulation in a rabbit's heart which had been removed from the body. It was kept at a temperature of 40° C. and showed regular contractions. After an hour it was placed in an ice-chest for eighteen hours, when the experiment was repeated, and after less than half a minute the heart recommenced its rhythmical contractions around the openings of the vena cava. In half an hour fairly strong but rhythmical contractions of the right ventricle were observed, but none of the left. In four and a half hours the pulsations ceased. In another case after the heart had been kept twenty-four hours in ice, contractions were reëstablished, and in another case after forty-four hours pulsations continued for over three hours.

Kuliabko (*Centralblatt für Physiologie,* 1902, vol. xvi, p. 330) also reports that instead of the hearts from healthy animals which had been killed, he took the hearts from rabbits that had died, and even on the second, third, and fourth day after death, after a longer or shorter circulation of Locke's fluid, the isolated heart was made to pulsate again and continued to pulsate for several hours. In August, 1902, he tried the same experiment on the heart of a boy three months old who had died from double pneumonia. Twenty hours after death the heart was removed from the body and Locke's fluid was used. For a long time the heart remained still, but finally after about twenty minutes feeble, long, rhythmical contractions of the auricle began, which later extended to the ventricle, and finally the entire heart began to pulsate and continued to do so for over an hour. Later he says that in a number of instances on the human heart as long as thirty hours after death pulsations were produced.

Velich (*Münch. med. Woch.,* Aug. 19, 1903, p. 1421) also placed a heart removed from a dog's body in snow for six hours, and was able to reëstablish contractions both in the auricle and ventricle. Again in a heart lying in snow for eighteen hours, and again after being frozen in salt solution for twenty-four hours, contractions of the auricle and even slight contractions of the ventricles were reëstablished.

Spina, of Prag, according to Velich's

very interesting article, proposed a new and apparently less dangerous method, which so far as I know has not been adopted in man. Up to this time most of the attempts had been made by mechanical methods to start contractions of the heart together with various devices for the purpose of filling it. Spina injected into an artery (not a vein), in the direction toward the heart, a considerable quantity of normal salt solution (200 cubic centimeters in a dog) at 35° to 40° C. Just before it reaches the cavity of the heart the fluid closes the aortic valves and finds its way into the coronary arteries, thus stimulating the heart muscle itself. In this way Spina and his pupils in many researches were able almost regularly to revive the action of the heart, both in animals in which the brain and cord had been destroyed and also in animals in which the heart's action had been arrested by poisoning with alcohol or other poisons. In one instance of a dog poisoned with nicotine he states that ten minutes after the heart had remained quiet artificial respiration was begun, and 200 cubic centimeters of normal salt solution with one per cent of grape-sugar were injected into the femoral artery in the direction of the heart. Even during the injection pulsations of the heart began. These became stronger, until the circulation was reëstablished as in a normal animal.

As early as 1896 Velich, and in 1899 Gottleib and Cleghorn, made experiments with adrenalin.

The latest experimenter in this direction is Crile, of Cleveland, in whose admirable study of "Blood-pressure in Surgery," just published, the results are fully given. He rightly calls attention to the fact that *we cannot expect to restore the apparently dead to life by resuscitation of the heart alone.* Not only must the heart be made to beat, but the respiration must be reëstablished, and the vasomotor center must be stimulated into renewed activity. To massage of the heart, therefore, we must add artificial respiration, and to both of these the means to restore vasomotor activity. These means he has shown by experiment to be infusion of adrenalin in salt solution and the pneumatic rubber suit. By the above means, without the rubber suit, he has repeatedly resuscitated animals whose heart had entirely ceased to beat for fifteen minutes. The pneumatic rubber suit can be inflated at will, and thus the blood-pressure be maintained at any given level. He relates several instances in which its use in man during operations seemed to be of great value. The most striking is that of a man with a severe depressed fracture of the skull whose heart had ceased to beat for nine minutes. The heart was restored to rhythmical action with a full radial pulse for thirty-one minutes, and while the bone was being elevated he made voluntary movements of the head. I have had no experience with the pneumatic suit.

I append below résumés of all the cases in which massage of the heart has been employed which I have found recorded in surgical literature, in order that we may see the practical results in man up to the present time.

As nearly as can be judged (for some of the cases are rather vaguely referred to), massage of the heart has been attempted in twenty-seven cases. Of these twenty-four have been failures, and in three (Cases 16, 25, and 27) restoration has followed—a very meager showing so far, but not a surprising number of failures when the gravity of the condition is considered. In fact the surprising thing is rather that any of them recovered. How far the other means used have been instrumental in recalling them to life—whether these alone would have been sufficient, whether the massage of the heart was essential to their restoration to life—it is difficult, if not impossible, to state with certainty. Moreover, in a few cases success seems to have been so nearly achieved that but little more would have been necessary to turn the balance.

Of one thing I feel assured, that Crile's position is correct when he says that surgeons as well as physiologists so far have fixed their attention too exclusively upon restoring merely the pulsation of the heart. This alone will not reëstablish life. The vasomotor and the respiratory centers must be awakened into rhythmical action as well as the blood be started on its vital round before we can hope to recall the apparently—or shall we say really?—dead to life. To accomplish this, massage of the heart, artificial respiration, the infusion of adrenalin in salt solution, and I think

very possibly Crile's ingenious pneumatic rubber suit, will all aid.

The methods by which the heart has been made accessible for massage are threefold:

First, by compression between the hands, one being applied outside the chest and the other directly upon the heart after an abdominal section, but without opening the diaphragm.

Secondly, by abdominal section, and after opening the diaphragm seizing the heart within the pericardial sac.

Thirdly, by resection of the chest wall, incision of the pericardium, and grasping the heart with one or both hands.

If abdominal section has already been done, the first or second method will usually be adopted, so as to avoid delay and the additional traumatism caused by opening the chest wall. If the operation which is being done does not involve an abdominal section, then an independent quick section is to be made in order to get access to the heart.

Of the successful cases, one of them, Starling and Lane's (Case 16), was done by this method. In my own case also I practiced the same method, but I must confess that I do not think as a result of this one experience that the heart is so easily seized and manipulated as by either the second or the third method.

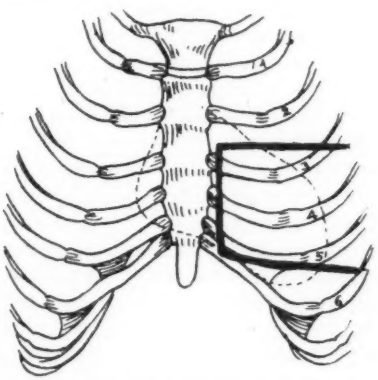

FIG. 3.—Usual incision to uncover the heart.

In the second method, either a definite incision can be made through the diaphragm to the left of the middle line and posterior to the border of the ribs, or, as in Poirier's case, the finger may be thrust through the diaphragm and the aperture enlarged simply by tearing.

The third method, exposure of the heart by resection of the chest wall, was used successfully in Igelsrud's case although the abdomen was already open. Fig. 3 shows the more usual method of gaining access to the heart. This is by resection of the third, fourth, and fifth ribs. In this particular figure I have made the incision run parallel to the third and fifth ribs, joining them by a vertical incision along

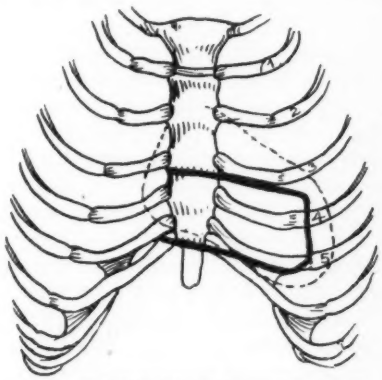

FIG. 4.—Wehr's incision to uncover the heart.

the left border of the sternum. The base or hinge of the flap is external. Different authors have preferred to make the base or hinge above, toward the median line, or below, and to make the flap rectangular or U-shaped. The great advantage of this incision is that the division of the bones can be made next the sternum through the cartilages of the ribs, and that a stout pair of scissors enables us to divide the ribs at other points. These instruments would always be in readiness.

Fig. 4 shows the incision proposed by Wehr (*Centralblatt f. Chirurgie*, 1899, Beilage, p. 74). In this incision only the fourth and fifth ribs are resected, and the base of the flap is on the right border of the sternum. This requires a saw or chisel to divide the sternum. These instruments might very possibly not be provided for the operation in hand, and of course there would not be time to disinfect them if they were not ready.

In any case care must be taken, if possible, to detach the pleura and not open its cavity, as this necessarily complicates the injury very much by adding a pneumothorax and possible collapse of the lung to the already serious condition of the patient. The pericardium is then incised, the heart is seized by the hand and rhythmical compression instituted.

CASE I.—Tuffier and Hallion (*Bull. et Mém. Soc. de Chir.*, 1898, p. 937). A man, aged twenty-four; appendicitis. On June 16, 1898, Tuffier operated and found a pericæcal abscess and gangrene of the appendix. The cavity was emptied and drained. For four days he did well. On the fifth day, during Tuffier's visit in the ward, the patient was feeling very well and asked for some wine instead of milk. Tuffier had only left his bed a few steps when he had an attack of syncope. Certainly not more than two or three minutes intervened before Tuffier was at his bedside; his body was relaxed, pupils largely dilated, respirations arrested, no pulse was discoverable, and the heart was immobile. Tuffier did not doubt that he had died as a result of an embolus. Artificial respiration and traction on the tongue were practiced, and the patient was thought to be dead. Tuffier immediately made an incision in the left third intercostal space, separating the pericardium with the index-finger, and made rhythmical compression for one or two minutes. The heart undulated at first irregularly, then followed a frank contraction, the pulse reappeared, the patient took deep inspirations, the eyes were widely open, and the pupils contracted. He turned his head as after a syncope. The wound was closed with an aseptic compress. After a few deep respirations the pulse again failed. Renewed rhythmical compressions established the circulation again for some minutes, but only to fail in spite of all his efforts. The autopsy showed a clot in the pulmonary artery with atelectasis of the left lung.

CASE II.—Bazy (*Bull. et Mém. Soc. de Chir.*, 1898, p. 939) states that in 1892 he saw one of his colleagues in the hospital employ the means described by Tuffier in a case of syncope from chloroform. The patient died.

CASE III.—Micheau (*Bull. et Mém. Soc. de Chir.*, 1898, p. 976) states that in a patient suffering from syncope following the administration of chloroform he instituted the same measures as described by Tuffier. Laying bare the heart after having used all the other means, the heart was compressed, but without result.

CASE IV.—Prus (*Wien. klin. Woch.*, No. 21, 1900, p. 486). A man, aged forty-eight, on January 19, 1900, hung himself. Wehr first did tracheotomy, and then opened the chest wall without injury to the pleura after his method. This, it is stated, was two hours after the attempted suicide. The heart showed no trace of movement. Prus seized it and began massage of the heart. At the same time air was driven into the lung by a long bellows. After the massage had been continued for fifteen minutes the first trace of independent rhythmical contraction of both auricles was observed; the systole started as a wave beginning at the junction between the auricle and ventricle and proceeded in the direction of the tip of the auricle. When massage of the heart was interrupted for some minutes the contractions of the auricle gradually became weaker until they entirely ceased. Upon renewed massage, however, they reappeared; but in spite of the continuance of the massage and injections of normal salt solution in the veins, the contractions of the auricle became gradually weaker and finally ceased.

CASE V.—Depage (*Annales Soc. Belge de Chir.*, 1901, p. 52). A man, aged forty-seven, with an irreducible inguinal hernia reaching to the knees. Radical cure was attempted. He had occasional suffocative attacks, and had the aspect of Bright's disease. The right heart was dilated and the pulse was irregular. There was a slight blowing sound with the first beat of the heart at its apex. Pulse 96; lungs normal; urine 1.031, neutral, a trace of albumin with pus, renal cells, and cylindrical epithelium. Chloroform was given with great care drop by drop. Ten grammes had been given and the patient was not completely relaxed, when he suddenly became pale, the respirations became superficial, and then ceased. The heart also ceased to beat. Artificial respiration was used with rhythmical traction on the tongue; head was depressed. Occasionally some deep inspirations were noted. After fifteen minutes an application of the cautery was made to the precordial region. No result having followed, he opened the chest by a curved linear incision at the border of the sternum from the second to the fifth rib. The flap was turned outwardly, the pericardium opened, massage of the heart with artificial respiration and rhythmical traction on the tongue was made. Slight spontane-

ous contractions of the heart followed after a few minutes, but they progressively diminished, and at the end of twenty or thirty minutes ceased entirely.

CASE VI.—Maag (*Centralbl. f. Chir.*, 1901, p. 20). A man, aged twenty-seven; nerve stretched under chloroform for sciatica. His heart was sound, there was no sugar or albumin in the urine. The patient had been a strong drinker, but of late years had entirely abjured alcohol. October 24, 1900, at 8 A.M., the narcosis was begun drop by drop on an Esmarch inhaler. After ten minutes he was sufficiently anesthetized for them to begin cleansing the area of operation. This continued for about five minutes, during which the patient lay quietly with good respiration, pulse, and contracted pupils. As the incision was made in the skin he struggled, and the anesthetist was requested to give him some more chloroform. Only a few drops were given, because almost immediately he became asphyxiated. Up to this time he had only received 15 grammes. The ordinary means of restoration were successfully used, and the operation was concluded in a few minutes without giving him any more chloroform. He, however, again became asphyxiated. The same restoratives as before, namely, traction on the tongue, artificial respiration, striking the precordium, etc., were used, but in vain. After ten or fifteen minutes tracheotomy was done and air was blown through the cannula into the lung. The patient was pulseless, without respiration, cold, and cyanotic. Accordingly the third and fourth ribs were cut close to the sternum, and a flap about 7 centimeters long reaching to the left mammary line was turned back. The hand was introduced into the pleural cavity and seized the heart in the unopened pericardium. There were no contractions. After a few rhythmical compressions the heart began to beat again feebly, and then gradually stronger and stronger. The compression was made sometimes simply by the hand which seized the heart; at other times against the posterior surface of the sternum. The air was blown into the lung through a rubber tube which fitted closely in the cannula. The nose and lips were compressed, so as to prevent the escape of the air that was blown in. After about a half-hour the first quick shallow respiration was taken, and these became deeper and deeper, but there seemed to be only one of these voluntary respirations; but when air was blown in they were repeated, so that there were first two and then three spontaneous respirations, and so on. Three hours after the anesthetic was begun the patient was able voluntarily to breathe about ten times. By 11.30 he began suddenly to take deep and regular respirations, the heart was beating seventy times in the minute, and only occasional compressions were made in order to stimulate it. The arteries in the area of the resection now began to bleed and were ligated. The tracheotomy wound also began to bleed, the pupils were contracted, the color of the face had been for some time normal, and the patient shut his mouth so tight that it was almost impossible to open it. The wounds were sewed, the resection wound only partially, so that if necessary the heart could be compressed anew. Some sterile strips of gauze were carried into the pleural cavity, the wound was dressed, and the patient placed in bed.

It seemed as if all danger were over excepting that the patient was not clear mentally. At 12 o'clock, as the surgeon was about to leave the hospital, his breathing suddenly became weaker, and after a few minutes ceased entirely. Air was again blown into the lungs, artificial respiration, faradism of the phrenic, infusions of oil of camphor, salt solution, etc., were used. Under these means the heart beat full and regularly until 8 P.M., when it suddenly ceased. During all these twelve hours the patient resembled one who was asleep, the color of the face was red, and the pupils contracted. The moment, however, that the heart contractions ceased he looked as one dead; the temperature fell slowly—at 4 P.M. 36.9°; at 5, 36°; at 6, 35.6°; at 7.30, 34°C. With this considerable meteorism developed, the stomach and the intestines being distended with the air that had been blown in.

Necropsy twenty hours after cessation of the heart pulsation. There were slight pleural ecchymoses, adhesions of the posterior portion of the right pleura, the heart was soft, valves and aorta sound, the diaphragm arched strongly upward by the distention of the stomach and intestines; otherwise nothing abnormal was noted. [This same case is also described by Frey-

berger, and is the subject of an editorial notice in the *Lancet* of April 13, 1901, p. 1092.]

CASE VII.—Mauclaire (*Gaz. des Hôp.*, Dec. 5, 1901, p. 1347-8) does not give the date. His account is as follows: "I have had occasion to put in practice direct massage of the heart once for syncope coming on at the end of an operation. Neither a return of respiration nor of pulsation of the heart was observed. The heart was reached by a resection of the fifth and sixth ribs, the pericardium was opened, and the heart seized in the hand. In view of the pneumothorax which inevitably is produced in this heroic intervention, I believe that it would be better to open the abdomen and incise the diaphragm corresponding to the pericardium."

CASE VIII.—Mauclaire (*Gaz. des Hôp.*, June 24, 1902, p. 701). April 14, 1902, a man, aged twenty, was crushed between a wall and a wagon wheel. There was a fracture of the third, fourth, and fifth ribs to the right and the second and third ribs to the left. There were exaggerated resonance on the left side of the thorax. The precordial dulness was not increased. The sounds of the heart were deadened and distant, and crepitus was present. The patient was dull and stupid, the respiration was arrested from time to time, the face pale, the pulse very slow, and it seemed that he would die from syncope. In view of the probability of lesion of the thoracic viscera and of some bloody exudate either inside or outside the pericardium, he decided to explore the pericardium and the heart, not by the anterior thoracic route, but by the diaphragmatic route. Chloroform was given. An incision was made from the xiphoid appendix to the umbilicus, the abdomen opened, the hand of an assistant pressed down the left lobe of the liver, and the stomach was depressed by compresses. The respiratory movements rendered the incision of the diaphragm very slow. Through the diaphragm the beating of the apex of the heart could be seen. It was not possible to determine whether there was any blood in the pericardium. An incision was made 5 to 6 centimeters to the right of the point where the beating of the apex was felt. The incision was made in several steps because of the depth of the region and the movements of the diaphragm, the xiphoid cartilage being subluxated upward. The pericardium being opened, a teaspoonful of a serous nonbloody fluid escaped, and along with it a puff of air showing the existence of a pneumopericardium, as was thought, but as no such lesion was found at the autopsy it was presumed that the movements of the diaphragm sucked the air into the pericardial cavity and then expelled it. A transverse incision of 3 centimeters made much more facile the introduction of the finger to explore the heart. A drain was then inserted in the incision through the diaphragm, but in such a manner that it projected but little into the pericardial cavity. It was secured by catgut to the edges of the diaphragmatic incision, which then was closed, followed by closure of the external wound. The patient, without showing symptoms of asphyxia or hemorrhage, died at 1 A.M.

The necropsy showed that there was no important lesion of the pericardium. There was a contusion on the posterior surface of the heart with some slight subpericardial ecchymoses.

The operation, as he points out in this case, was exploratory and not therapeutic. No massage of the heart was made.

He then recounts two cases of massage of the heart by the anterior thoracic route, Cases 9 and 10, as follow:

CASE IX (Mauclaire).—In February, 1899, he resected the sternal extremities of the third, fourth, and fifth costal cartilages, producing a pneumothorax. The pericardium was opened in order to massé the heart as a consequence of chloroform syncope, but without result. No further details are given.

CASE X (Mauclaire).—In May, 1902, he saw a case of syncope from chloroform. After artificial respiration, rhythmical traction on the tongue, and tracheotomy produced no effect, he made a similar incision through the diaphragm and practiced rhythmical massage of the heart, without result.

The operative method which he recommends is slightly oblique from right to left and from in front backward, starting from the middle of the concavity of the diaphragm slightly in front of its summit. The beating of the heart against the diaphragm can be recognized, and the inci-

sion is a little in front of this point. The incision should be 4 to 5 centimeters long in the direction of the point of the heart, but without involving it. As soon as the diaphragm is penetrated, the rest of the incision should be made with scissors on the forefinger as a guide.

CASE XI.—Poirier (*Bull. et Mém. Soc. de Chir.*, 1902, p. 43). December 5, 1901; a woman aged fifty-eight. She was very cachectic and so feeble that she could not walk. The diagnosis was a gastric tumor. All food was rejected. Operation under chloroform. She was anesthetized quickly and easily without any resistance or mental fright. The stomach was found adherent throughout to the liver by old adhesions. They were separated without much trouble. A few sutures were placed in the liver to arrest a little oozing. A very extensive disease of the stomach being discovered, a posterior gastroenterostomy was decided upon. As the omentum was raised the patient made a few movements and the recti muscles contracted. The anesthetist was requested to give a little more chloroform. Scarcely had the compress been placed over her face when her heart suddenly ceased to beat. She became very pale, pupils dilated, respirations ceased, and everything characteristic of death was present. At the same instant rhythmical traction of the tongue, artificial respiration, and flagellation were all used, but without the least result. Tracheotomy was immediately done by puncture and oxygen administered; the phrenics were also stimulated by electricity, movements of the chest only being obtained. As all efforts seemed to be in vain, by suddenly pushing his thumb Poirier split the ensiform portion of the diaphragm and seized the heart. This was found relaxed and empty. No part of it responded to pressure or pinching. Artificial respiration was continued for a long time, but without avail. The amount of chloroform used was between 30 and 35 grammes.

CASES XII and XIII.—Gallet (*Rev. de Chirurgie*, 1902, vol. xxvi, p. 625) states that his colleague, Dejace, has practiced massage of the heart twice without result.

CASE XIV.—Gallet (*Jl. de Chir. et Annales de la Soc. Belge de Chir.*, November-December, 1902, p. 165). A man aged twenty-eight; inguinal hernia with a tuberculous peritonitis discovered at autopsy. After a few inhalations of chloroform, he died from cardiac syncope. The usual means were employed in vain. Massage of the heart was made twenty minutes after the syncope began, the chest being opened, but the pericardium not opened. The massage was done rhythmically, and also artificial respiration. The blood flowed in abundance in the jugular vein, and even at the level of the femoral artery the finger could perceive a pulse at each artificial systole. The only evidence of returning life were fibrillar trembling of the heart and slight coloration of the face.

CASE XV.—Gallet (same reference). A woman, aged thirty, with a pelvic abscess. The same history as the preceding case, excepting that the massage of the heart was performed a half-hour after the syncope began, and that the pericardium was opened.

In experimenting on a dog he found that the arterial pressure in a large vessel is about 14 centimeters and is elevated slightly at each systole. When cardiac syncope occurs, the pressure descends to zero, and with each pressure of the heart only rises to 4 or 5 centimeters, and immediately falls to zero in the interval between the compressions. In the veins the pressure only rises from 2 to 3 centimeters above zero. Gallet thinks that such an intervention is useless and also dangerous, no matter by what route the heart is reached.

CASE XVI.—Starling and Lane (*Lancet*, Nov. 22, 1902, p. 1397). A man sixty-five years of age was operated on by abdominal section for adhesions about the colon. Ether was given by a Hewitt's large-bore inhaler, preceded by gas. The patient was of the thin, nervous type, with a muffled bruit of the first sound at the apex. The anesthesia proceeded normally. The appendix was removed. The pulse then began to flag; the respiration, which was shallow, was not affected. More ether was given, but during the trimming of the stump both pulse and respiration stopped altogether. Artificial respiration was tried without effect. Mr. Lane, the surgeon, then introduced his hand through the abdominal incision, and through the unopened diaphragm squeezed the motionless heart once or twice. It started

beating again, but the respirations were still in abeyance. Artificial respiration was still continued, and other restorative measures adopted. The artificial respiration was continued for about twelve minutes, when natural respiration began again with a long sighing respiration. The operation was then completed without any further anesthetic. The patient felt the skin sutures slightly. Excepting for a little soreness about the diaphragm for two days the patient made a good recovery.

CASE XVII.—Zesas (*Centralblatt f. Chirurgie,* 1903, p. 588) relates that in 1880, while he was assistant to Niehaus in Berne, he observed the following case: A man of forty, who was operated upon for goitre, which was producing both dysphagia and dyspnea. Heart and lungs were normal, no arteriosclerosis, urine normal. The narcosis was proceeding regularly, when suddenly, before the beginning of the operation, his breathing ceased and he became cyanotic. The pupils were widely dilated and immobile, pulse disappeared, no trace of heart contraction was either felt or heard. Artificial respiration was used for some time, when Niehaus resected the ribs, laid bare the heart, and began rhythmical compression. Artificial respiration was continued. The heart, which at first was soft, became somewhat firmer, later twitchings were felt in its muscular wall, but there was never a normal contraction. The necropsy by Langhans showed nothing abnormal.

CASE XVIII.—Sick (*Centralblatt f. Chirurgie,* Sept. 5, 1903, p. 981). A boy of fifteen with tuberculous ascites, but with normal lungs and heart, was operated on December 18, 1902, by laparotomy. About one liter of turbid serum was removed. In the parietal and visceral peritoneum and the mesentery countless tubercles were discovered. The liver and spleen were enlarged. As he was about to close the wound the patient began to struggle and vomit. Chloroform was therefore again given in order to quiet him. Only a few drops were given, but in from five to ten minutes sudden cyanosis set in and the pulse ceased, breathing continued for a moment, and then also ceased. The upper air-passages were free. Artificial respiration and compression of the heart through the chest wall were instituted; breathing returned for a minute, and the dilated pupils contracted. The cyanosis was unaltered; the pulse could not be felt, but slight pulsation of the heart could be heard; breathing and the heart's action, however, again ceased. The same means for restoring were repeated, and continued for half an hour without result. At this moment Sick entered the room. There was no movement of the heart; the pupils were widely dilated, cyanosis was marked, the whole body cold. He immediately exposed the heart by the method of Rotter. It was now three-quarters of an hour since the heart ceased to beat. The flaps did not bleed, the pericardium was also bloodless, the heart lay relaxed and was cool. Artificial respiration was continued, beginning with energetic rhythmical compression of the heart itself. After a quarter of an hour breathing returned, and the first perceptible systole was observed. This had been preceded by irregular vermiform twitching of the muscle of the heart. The first contraction and firm consistence of the heart muscle followed directly as a result of hot compresses, which during the compression of the heart were quickly and constantly changed and applied to the heart. The patient also had applications of hot towels and a hot enema. A half-hour after laying bare the heart—that is, one and one-quarter hours after disappearance of all signs of life—the heart was beating regularly and strongly. Breathing returned, the pupils were normal, his color was good, his radial pulse could readily be felt. The pericardium, therefore, was closed with a continuous catgut suture; the slightly bleeding walls of the thorax were closed with tamponage. Two hours after the termination of the operation the patient became conscious, and complained of great thirst and dyspnea. Respirations 60, pulse 144. Camphor, salt solution, with some alcohol, etc., were used, and the condition of the patient remained about the same for twenty-four hours. His speech was indistinct, but not unintelligible. After this time he collapsed, and after suffering with great dyspnea died three hours after return of unconsciousness.

The necropsy showed a firm contraction of the heart, a right fibrinous pericarditis, an old double pleurisy, recent

swelling of the liver and spleen, and marked tuberculosis of the peritoneum and mesentery.

CASE XIX.—Djemil Pacha (*New York Medical Record*, Jan. 23, 1904, p. 146) relates the case of a man of thirty, upon whom he was operating for fistula in ano, who had inhaled 10 grammes of chloroform, when heart syncope occurred. "After two minutes' trial of ordinary means to restore animation without success, he opened the thorax and practiced massage of the heart, which had ceased to beat. The heart movements were reëstablished and some respirations were secured. Unhappily the patient succumbed."

Dr. Geo. W. Crile, of Cleveland, Ohio, has kindly furnished me with the following cases:

CASES XX and XXI (Crile).—Two Hungarian laborers were struck by a pony engine near Lakeside Hospital, causing compound depressed fractures of the occipital bone and compound fracture of the base of the skull. On arriving at the hospital both were in a dying condition. One died on being carried in to the accident room. Nine minutes later efforts at resuscitation were begun. This consisted in rhythmic pressure upon the thorax over the heart, artificial respiration by means of the Fell-O'Dwyer apparatus, the infusion of 1-to-50,000 solution of adrenalin chloride into the median basilic vein, and the application of the pneumatic rubber suit. Directly following this the heart suddenly resumed a good, vigorous action, more vigorous than the normal. This continued for twenty-eight minutes, when the circulation failed. He did not regain consciousness, and spontaneous respirations were not reëstablished. At autopsy it was found that the base of the skull was severely crushed, and with it the tissues of the brain.

The second patient was not observed during the resuscitation of the first, and when it was obvious that the first one could not be resuscitated, I examined the second case and found him dead. From the time of this observation until the efforts at resuscitation were begun was eight minutes. Precisely the same treatment was carried out in this case as in the first. In sixteen minutes the heart suddenly began to beat strongly as in the first case, also showing an overaction at first. At that time Dr. Ford made a blood-pressure observation with a Riva-Rocci sphygmomanometer, and found it to be 80. The pulse was full, regular, and about normal rhythm. Spontaneous respirations soon began, and his condition seemed promising. His head was scrubbed, shaved, and prepared for operation. An incision was made, the depressed skull was raised, bleeding arrested, and the wound closed. During the operation the patient moved his head rather vigorously away from the operative field, but uttered no sound. During this time spontaneous respiration was maintained. The patient lived thirty-four minutes, when the heart and respiration rather rapidly failed, and he died. Further efforts were of no avail. At autopsy the brain showed extensive lacerations at the base. In both cases the lesions were necessarily fatal.

CASE XXII (Crile).—Male, aged thirty-eight; tumor at the base of the brain. Died during operation; resuscitated; died again two hours later. The patient presented a clear history of a tumor of the brain, which was supposed to be located well down toward the base. A large osteoplastic flap had been made, through which the right side of the tempo-ro-sphenoidal and occipital lobes as well as the cerebellum were explored. The tumor was located underneath the occipital lobe, and while raising up this lobe and trying to dislodge the tumor, the patient, who had been growing weaker during the operation, suddenly collapsed and died. The rubber suit had been applied and had been inflated during the failure of the circulation. In eight minutes an infusion of adrenalin chloride, 1 to 25,000, in normal saline solution was administered in the median basilic vein. Artificial respirations were maintained by means of the Fell-O'Dwyer apparatus, and rhythmic pressure upon the thorax over the heart was systematically made. The pressure in the rubber suit was increased. In nine minutes after beginning of resuscitation, and seventeen minutes after complete cessation of the heart, the latter suddenly began to beat, and in about twelve minutes spontaneous respirations were reëstablished. The wound was then closed and the patient removed to the ward, during which time a continuous flow of adrenalin

solution at the rate of 3 cubic centimeters per minute was continued. The patient died two hours after the time of the resuscitation.

CASE XXIII (Crile).—Male, forty years old; struck by a telephone wire falling across the street-car conductor. Was seen at the morgue 2½ hours after the accident occurred. From that time attempts at resuscitation were made by Drs. Ford, Heath, and Dickison, as in the cases above described. Resuscitation was not accomplished. Rigor mortis was in evidence at the time of beginning the attempt at resuscitation.

CASE XXIV (Crile).—Electric lineman, aged twenty-six. While repairing a wire received an electric shock, causing his immediate death while suspended from the wire about thirty feet above the surface of the ground. Four hours later an attempt at resuscitation by Drs. Lower and Ford by the above methods was made, but did not succeed.

CASE XXV (Crile).—Sudden death during excision of exophthalmic goitre, Lakeside Hospital, Feb. 2, 1904. Female, aged twenty-eight, who had been in the hospital for nine weeks for treatment of exophthalmic goitre, by medical means had not improved. During this time the pulse varied from 90 to 150. The exophthalmia became more marked. All her nervous symptoms were greatly increased, there being delirium at times during the week past. There were attacks of syncope, though in bed and at the most perfect rest. The patient was operated under ether anesthesia, with every precaution against the loss of blood or the manipulation of the tumor. During the operation her general condition was closely watched by her physician, Dr. H. J. Lee. The heart had been beating at the rate of 144 to 150 per minute during the entire operation. After the completion of the dissection, and after almost all of the ligatures had been tied, the patient went into a sudden collapse. The heart's action entirely ceased; respiration continued for less than a minute later. A pneumatic rubber suit as a precautionary measure had been put on, but not inflated, before the operation was begun. Rhythmic pressure upon the thorax over the heart was at once made, and the rubber suit inflated as rapidly as possible. After an interval of between five and six minutes the heart slowly began to recover its beat and the circulation was reëstablished. It was intended to use the infusion of adrenalin, which was ready to be given just as the heart began beating. Spontaneous respiration was resumed. The operation was completed, and the patient sent to bed with the circulation supported by the rubber suit, which was gradually decompressed during a period of one and a half hours. Following this the patient did well. The pulse in the meantime had fallen from 160 to 132.

CASE XXVI.—Keen (*vide ante*).

CASE XXVII.—Igelsrud (*vide ante*).

[*Postscript.* — By an unaccountable oversight, although I had a note of the case of massage of the heart reported by Dr. Cohen in the *Journal of the American Medical Association,* November 7, 1903, it was omitted from my tables. This would make 28 cases and 4 recoveries.]

SOME OBSERVATIONS ON THE SURGICAL PHYSIOLOGY OF THE VASCULAR SYSTEM.[1]

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The privilege of presenting a paper before the W. W. Keen Surgical Society is very much appreciated, and in view of the high standard of lectures by the brilliant coterie of teachers of Jefferson Medical College, the hazard is equally realized. Because I have been particularly desirous of again calling attention to the importance of making a more practical application of some of the facts of physiology to surgical practice, I have chosen for my subject "Some Observations on the Surgical Physiology of the Vascular System." In the outset I wish to state that I have nothing new to present to you, but shall hope to offer some suggestions for research for development in this important field.

The normal heart muscle is characterized by its capacity for work without fatigue. This view is supported by such observations as the vast amount of work it is known to perform in physical endurance tests, the remarkable increase in its

[1] An address before the W. W. Keen Surgical Society of the Jefferson Medical College.

work in certain valvular lesions, its ability to force the blood in sufficient quantity through the peripheral circulation in the presence of extreme arteriosclerosis in cases in which the systolic blood-pressure may be as high as 300 millimeters mercury, its ability to continue its work when its nerve mechanism is wholly severed, when the animal is not only decapitated but when the peripheral resistance is raised higher than normal, its ability to resume and continue rhythmic contractions when it has been kept on ice as long as forty-four hours after death.

The normal heart, then, is an organ of great functional durability and not readily fatigued. What is the relation of the cardiac action to the blood-pressure? It is a secondary factor. What is its relation to the rate of flow of blood? It is primary. Now the pulse is the conventional clinical index of the circulatory state. What part in the alterations in the pulse, in injuries, in operations, and in infections does the heart play? Only a secondary part.

Unlike the cardiac muscle, the muscle of the walls of the blood-vessels has no automatic action independent of the nervous system. It is under its continuous regulation. The vasomotor centers are in constant action, a delicately responsive action of a remarkably complex nature.

What part does the vasomotor center play in the creation and maintenance of the blood-pressure? From the standpoint of physics it is clear that the key to the blood-pressure lies in the peripheral resistance, but the peripheral resistance is wholly dependent upon the vasomotor centers. The action of the vasomotor center, then, primarily creates the blood-pressure. Roughly speaking, the heart causes the flow of blood, and the vasomotor mechanism determines the height of the blood-pressure. The pulse characteristics of the greatest clinical importance are therefore of vasomotor origin.

A bounding pulse indicates an increased action of the vasomotor centers; a soft pulse, a diminished action of these centers. The bounding pulse in the period of development of many of the acute infections is caused by a pathologic stimulation of the vasomotor centers. The fall of the blood-pressure to the normal as the process subsides is an indication that the toxins have been neutralized and eliminated, and have ceased forming. But the terminal fall in fatal cases indicates a breakdown of the vasomotor centers.

In certain other acute diseases the toxic products depress the vasomotor centers—notably typhoid fever. Will some future investigator not clearly elucidate the fundamental facts of surgical physiology upon which the characteristic circulatory phenomena of typhoid and peritonitis rest? We may at present go as far as to say that in typhoid the vasomotor centers are depressed; in peritonitis they are stimulated. What a splendid problem for research is presented by the following circulatory characteristics in these two diseases, and of how much importance will such discoveries be in the diagnosis of typhoid perforation! In typhoid the pulse is of large volume; in peritonitis it is small. In typhoid the pulse is soft; in peritonitis, hard. In typhoid it is relatively slow; in peritonitis it is rapid. In typhoid, dicrotism is usually present; in peritonitis, rarely or never. In typhoid the wave is long; in peritonitis, short. In typhoid, capillary pulse is frequently present; in peritonitis, rarely or never. In typhoid there is usually an increased blood-supply, frequently not well oxidized, to the face, the front and sides of the neck, and the upper part of the thorax, giving an almost characteristic dusky redness; in peritonitis there is a diminished supply of blood to this territory, giving an almost characteristic pallor.

In typhoid, then, the pulse is of large volume, low tension, frequently or usually dicrotic, has a long wave, is of relatively slow rhythm, and frequently capillary. The face and neck are peculiarly flushed. In peritonitis the pulse is of small volume, high tension, relatively rapid, rarely or never dicrotic or capillary, and it presents a short wave. The face and neck are peculiarly pale.

The clinical picture of the circulation in typhoid and peritonitis presents physiologic antitheses. The actual blood-pressure alterations were studied by means of a sphygmomanometer in both diseases. The mean normal systolic blood-pressure may be stated to be 130 to 135 millimeters. In observations upon one hundred and fifteen cases of uncomplicated typhoid with normal arteries, the maximum pressure was 138 millimeters; the minimum, 72; the mean, 104. In the first

week the mean pressure was 115 millimeters; the second week, 106; the third, 104; the fourth, 96; the fifth, 98. In twenty-one cases of fully developed, acute peritonitis the maximum blood-pressure was 208; the minimum, 148; the mean, 165 millimeters.

That the rise was due to the toxic products of the infection was supported by the observation of a similar rise in the blood-pressure in acute infections in various other parts of the body, and following the injection of Coley's toxins in the treatment of sarcomata; in the latter instance a rise of from fifteen to thirty millimeters was noted even before either the temperature or the pulse showed any alteration.

In six cases of peritonitis following typhoid perforation, a rise varying from eight to forty millimeters was noted. In three cases the first observations were made late; in two they were made early, and the pressure showed an early rise. The physiology of the circulation is sufficiently understood to enable us to at once conclude that the increase in the blood-pressure is due to the increased action of the vasomotor center. This brief allusion to the surgical physiology of typhoid perforation is made for the purpose of calling attention to a tempting research problem.

Let us allude briefly to a few points in the surgical physiology of injuries and operations. The simultaneous slowing of the heart and the rise in the blood-pressure in many cases of depressed fracture and cerebral hemorrhage are but plain translations of the simple laboratory experiment of simultaneous mechanical stimulation of the vasomotor and the cardioinhibitory centers. In the slowed pulse and high blood-pressure in apoplexy how frequently is the unthinking clinician led into a position of false security. Even the beginner in physiology knows that asphyxia is a marked vasomotor stimulant, causing a rise in the blood-pressure and a slowing of the pulse rate, yet the interne when the patient becomes cyanotic in an anesthetic difficulty usually takes much comfort in the full, regular, strong pulse, which is characteristic of the first stage of death by asphyxia. Or realizing that his patient is not exchanging air because of the recession of the tongue, drags this organ forward with more energy than judgment, causing thereby a reflex inhibition of the respiration he is trying to restore. Seeing no result he thrusts a sponge deep into the pharynx of the patient, making the inhibition he is striving to overcome doubly sure by mechanical stimulation of the superior terminals of the superior laryngeal nerve. Physiologic relief usually comes by his transferring his energies to artificial respiration, giving the much needed rest to the tongue, pharynx, and larynx, permitting the resumption of spontaneous respiration. Should the effort take the form of sudden violent pressure upon the thorax over the heart, the action of this organ, owing to the relaxed thoracic wall, may be temporarily impaired.

One might, in passing, refer to the reflex inhibition of the heart and of the respiration in operations upon the larynx; to the difficulty of diagnosticating at first sight between foreign bodies in the pharynx and in the larynx, since either may cause inhibition; to the cause of sudden death in blows upon the larynx and in throttling, as well as to the physiologic antithesis of the trachea—injuries or operations upon which, barring obstruction, cannot cause inhibition of either the heart or respiration, hence cannot cause immediate death. One might mention that the importance attributed to the so-called solar plexus blow is not founded on fact, that even crushing this structure cannot cause immediate death; that fatal blows upon the lower ribs or pit of the stomach usually cause muscular relaxation and are due to direct traumatism to the heart; that manipulation of the visceral mucosa causes but little circulatory disturbance, but that manipulation of the peritoneum causes disturbance of the circulation in direct proportion to the amount of manipulation and the area involved, so that as definite a dosage of shock may be administered as of calomel; that if the operator sponged twice where once would do, he has physiologically inflicted two laparotomies upon his patient instead of one; that the omentum is the physiologic antithesis of the peritoneum, is almost shock proof, and should be used as a surgical buffer; that trauma of the testicles and spermatic cord causes a marked fall in the blood-pressure by producing a dilatation of the vessels in the splanchnic area, but that trauma of the uterus, ovaries, and

tubes causes a marked rise; that manipulation of the sigmoid and the rectum from the pelvic side, dilatation of the cervix, divulsion of the sphincter ani, and certain operations upon the vagina cause a marked stimulation of the respiration, especially its inspiratory phase, which, should the anesthetizer not be warned, may, especially if chloroform anesthesia is being administered, cause dangerous narcosis resulting in collapse and even death.

One might direct attention to the frequent misinterpretation of the physiologic increase in blood-pressure; hence pulse, during operations upon the extremities in traumatic cases, which is entirely due to the mechanical stimulation of the sensory nerves, and which is certain to be followed by a fall proportionately lower than it was before. This false encouragement tends to lead to too extensive operative procedures.

The surgical physiology of the circulation, we believe, permits us at present to say that since the vasomotor centers in what is called operative shock are exhausted, vasomotor stimulants in the form of drugs are no more indicated than are vasomotor stimulants in the form of additional traumatism; that since the heart is not primarily involved, and since it has but slight power of raising the blood-pressure at best, but little can be expected of cardiac stimulation.

The *sine qua non* in the relief of the low blood-pressure is a peripheral resistance. Therapeutically, then, it must be obtained, if at all, by drugs acting upon the walls of the blood-vessels. Adrenalin is the most powerful drug thus acting. Its value is still in the experimental stage. Among the methods proposed for securing a peripheral resistance is the rubber pneumatic suit, which gives a definite control over the circulation, as measured by the systolic blood-pressure, of from 25 to 50 millimeters mercury. Decompression may be gradually made. By this means the patient may, during the operation, be placed in almost any posture as the blood may be delivered against gravity to the right heart. Even immediately after apparent death, when all the organs are sound, by rhythmic pressure upon the thorax over the heart, artificial respiration, and the maintenance of a certain peripheral resistance by means of an infusion of adrenalin chloride in saline solution, 1:25,000, or by the application of surface pressure by inflation of the pneumatic rubber suit, animation may be reestablished. Recently while excising an exophthalmic goitre, suddenly and without warning animation was suspended for between five and six minutes. By the prompt application of this method animation completely returned. In another a distinct circulation was secured after complete arrest of 11 minutes; in another, 18 minutes; and in another, 24 minutes. None of the latter cases finally survived. In animals, even after fifteen minutes of conventional death, life was restored.

In Summary.—Border-land studies of physiology and surgery seem to teach us that the great principles established in the laboratory of physiology may be translated into the language of the surgical operating-room; that the knowledge of function should be as full and accurate as the knowledge of form; that while human form has been minutely studied in the laboratory on the dead subject, the surgical knowledge of human life has in the past been acquired at random upon the operating table; that circulatory phenomena observed in the operating-room conform to definite laws; and that while present physiologic knowledge gives us very considerable control over the circulation during life and a fair promise to reanimate certain of the recently dead, only the title of the great book of surgical physiology has been written, and the entire volume of knowledge upon this subject remains for the younger generation to supply.

THE ADVANTAGES OF ABDOMINAL OVER VAGINAL HYSTERECTOMY IN CARCINOMA.[1]

By John B. Deaver, M.D.,
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One of the most deadly forms of cancer is that of the uterus. The fact that cancer of the uterus appears in many instances insidiously makes it all the more serious and more likely to be overlooked than similar conditions in other parts of the body.

The writer sees a large number of cases

[1]Read at the meeting of the Philadelphia Academy of Surgery, March 7, 1904.

of uterine carcinoma each year, many of which have passed beyond the stage for operation. Unfortunately many of the subjects of this disease suffer from symptoms not at all well defined, are free from pain, and have but little discharge until the growth has become so extensive as to forbid radical interference; for this reason the family doctor is often unaware of the real nature of the disease until it is too late to resort to surgical interference.

Irregular bleedings from the uterus, whether before, during, or after the menopause, should excite the apprehension of the general practitioner, as well as the surgeon, to investigate at any rate. It is absurd to consider feelings of delicacy and allow them to prevent an inspection of the cervix and palpation of the body of the uterus; nor in doubtful cases should fear of consequences deter resort to curettage with examination of the scrapings. Negative findings by the pathologist should be accepted with great reserve and not allowed to controvert unmistakable clinical symptoms, especially in women approaching or past the menopause. I emphasize the latter because, as is well known, epithelioma rarely begins until after the child-bearing period.

The differentiation between hemorrhagic endometritis and commencing malignant disease is not always possible; in fact, it is the practice of the writer in those cases of hemorrhagic endometritis occurring about the change of life, with a large and flabby uterus and a malignant family history, to make a complete removal of the uterus.

In hemorrhagic or hypertrophic endometritis with foul-smelling discharge, the uterus should be curetted and the findings examined microscopically. A negative finding does not necessarily prove the absence of carcinoma, as the curette may have escaped the cancer area, or the carcinoma be within the uterine muscle. Excision of a small portion of the uterine tissue for microscopical examination can only be considered where the disease is of the cervix.

The class of cases of carcinoma of the uterus which perplex the surgeon most in determining what is best to do are those which are not seen early; when it is questionable whether the tissues outside the uterus are involved, rendering it difficult to determine even the propriety of radical interference. The most common site of carcinoma of the uterus is the cervix, which is usually squamous-celled, and early in the disease is essentially a local process, hard and indurated, with papillæ elevated from the surface of the mucous membrane. These papillæ increase and enlarge, giving rise to the cauliflower-like growth so often seen; ulceration and necrosis soon follow, implicating the vaginal vault, the broad ligaments, the bladder, and rectum. When the case has assumed this stage radical treatment is, as a matter of course, not to be considered. One of the important questions to be decided in the operation for radical cure of carcinoma, be it situated in the uterus or elsewhere, is: Can the excision of the cancer area be performed by section through normal tissue?

For the relief of the discharge, the bleeding, or the pain in advanced carcinoma of the uterus, local measures, as the curette and cautery, are more efficacious than the use of the knife. The most careful bimanual examination must be made to determine the advisability of radical operation, also must the patient's general condition and the absence of other organic lesion be favorable. The radical operation is, in the writer's judgment, only to be considered in the early stages of the disease. The writer has found that the pain consequent upon the recurrence of carcinoma following late and extensive operation is greater than in cases of the kind which have been curetted and cauterized.

The writer practices and strongly advocates total ablation of the uterus by the abdominal route in early carcinoma of the cervix. I feel sure this operation promises more, both immediately and ultimately, than does the removal by the vaginal route. In the early stages I believe complete removal of the uterus, broad ligaments, and the lymph channels in the latter, with possibly the iliac lymph glands in some cases, should guard against recurrence with reasonable security.

It is interesting to note that Professor Jacobs, of Brussels, one of the earliest advocates of vaginal hysterectomy for cancer of the uterus, has entirely changed his views, and now only does the vaginal operation when the abdominal route is impracticable. Jacobs states that he never has had a case of uterine cancer operated

upon by the vaginal route to live more than three years, and that the majority of them were dead at the end of one year. In contrast to this he has a number of cases upon which he operated by the abdominal route that are living and well after four years. Jacobs practices the removal of the pelvic glands.

Prof. von Rosthron, of Heidelberg, also practices cleaning out of the glands of the pelvis in carcinoma of the uterus; in fact, this is the common practice at the present time on the continent. It would seem as reasonable to remove the glands of the pelvis in connection with removal of the uterus in early carcinoma as it does to remove the glands of the armpit in early operation for the removal of cancer of the mammary gland. It scarcely seems necessary to say that this is a useless procedure where there is already systemic involvement. The Halsted operation for carcinoma of the mammary gland, as practiced by the writer, is only done in the early cases. I believe it is useless to make so extensive a dissection after there is advanced involvement of the axillary, subclavian, and supraclavicular glands. When the latter condition is present it is evident that the disease has advanced beyond the reach of the surgeon's knife, particularly in the shape of involvement of the intrathoracic glands.

I strongly oppose vaginal hysterectomy in carcinoma of the cervix, except in the presence of obstacles necessitating such a course—for instance, a very stout abdomen, nephritis, etc. Early carcinoma of the fundus of the uterus is the condition in which I practice vaginal hysterectomy, and not in the cases where sufficient time has elapsed to have allowed the lymphatics of the cervix uteri to become involved.

The vaginal operation in carcinoma of the cervix offers no advantages over abdominal section when the latter is properly performed, and suffers from the charge of being an incomplete procedure, dangerous to the ureters, and liable at any time to be followed by secondary bleeding. The abdominal operation certainly gives the only chance for the proper cleaning of the pelvis, offers greater security against hemorrhage, and with less risk of injuring the ureters; the field of operation is kept constantly in view, the patient in the Trendelenburg position, and the intestines kept out of the way of injury and infection by the proper placing of gauze pads. That we can cut farther away from the diseased area in the abdominal than in the vaginal operation we must admit.

In the abdominal operation I never have any feeling of injuring the ureters if the bladder with the anterior serous flap is carried well forward and upward behind the pubic bone. If the operator is not content with this it is a simple matter to expose the ureters. The question of the introduction of ureteral catheters or bougies to safeguard the ureters has not been my practice. I have always feared more the consequences of carrying an instrument from the bladder into the ureters and exposing the kidneys and ureters to the danger of infection than I have injury to the ducts.

It will not be understood that I am an advocate of dissection of the lymphatic glands of the pelvis in all cases of carcinoma, for I am not by any means. I do believe, however, that in certain selected cases this operation is not only feasible, but in order. In this connection I would furthermore like to say that the dissection of the pelvis should be done as readily, the conditions requiring it, as a deep dissection of the neck; the same amount of care in exposing the lesion and the structures in relation therewith, thus avoiding unnecessary mutilation, should be carried out in the same anatomical manner as in the dissection for the removal of an enlarged thyroid gland. This being done, fewer ureters will be injured, fewer cases of secondary hemorrhage, of postoperative vesical fistula, intestinal fistula, etc., will have to be noted. The individual ligation of vessels of any size as opposed to the mass ligature or the use of that abominable instrument, the angiotribe, be it the plain or electrical hemostatic instrument, I strongly urge.

In connection with the discussion of the propriety of the removal of the pelvic lymph glands, it is interesting to note that the lymphatic system of the uterus is composed of a rich network of vessels, those from the vagina and lower portion of the cervix following the uterine vessels to glands at the bifurcation of the common iliac arteries, usually three in number, whence they pass upward. The lymphatics of the body of the uterus anastomose with those of the cervix uteri,

travel downward to the deep inguinal glands by way of the round ligaments, and pass through the utero-ovarian ligaments, emptying into the lumbar glands. Notwithstanding these abundant lymphatics, carcinoma of the uterus spreads more rapidly by continuity of tissue than through lymphatic metastasis; therefore the argument in favor of removal of the pelvic glands is weakened. Certainly the only cases that promise anything are those where the glands have not yet become involved. Our experience teaches us that extension of the cancer downward into the vagina and backward into the rectum is much more common than metastasis into the pelvic glands.

Epithelioma of the vagina has been overlooked as a point of metastasis or implantation, the diseased area, believed to have occurred in preparation for operation, resembling so much an excoriation, and has been mistaken for such. Early involvement of the bladder may be recognized only by means of a cystoscopic examination.

The technique of the abdominal operation is comparatively simple. The abdomen is opened through the right rectus muscle, the contents of the pelvic cavity palpated to determine the presence of adhesions, and if the disease has extended beyond the uterus the patient is placed in the Trendelenburg position; the intestines and great omentum are protected by gauze pads carefully placed. With the gauze pads properly placed the field of operation in the pelvic cavity is well exposed. Traction is now made upon the fundus of the uterus, drawing it upward and backward, when an incision is carried from the pelvic end of one round ligament to that of the other, and through the serous covering of the anterior surface of the uterus at the point of reflexion of the peritoneum from the uterus on to the bladder. This serous flap is displaced downward carrying the bladder with it; the dissection is carried as far down as possible, in this wise displacing the bladder upward behind the pelvic bone, thus exposing the anterior wall of the vagina and carrying the ureters out of harm's way. The next step in the operation is tying off the ovarian arteries to the outer or inner side of the ovary or ovaries, depending upon the advisability of removing or leaving them. It is the practice of the writer to leave the ovaries in cases of carcinoma occurring in early life. To retain the ovaries when possible I regard as highly important; nothing can add more to the future comfort of the patient. the premature menopause being a most distressing condition. The disturbance of the nervous system occasioned by the removal of organs, the internal secretion of which is of so much value to the well-being of the individual, is acknowledged. The uterine arteries and veins are next exposed as they pass from the side of the pelvis to the cervix uteri and tied between two ligatures and divided; in making the dissection to expose these vessels the ureters are exposed, and thus rendered less liable to injury.

The next step in the operation is cutting the cervix out of the vagina with the removal of the organ. The vaginal walls are now whipped over with a continuous catgut suture, a piece of iodoform gauze placed in the vagina, allowing a small portion of it to protrude into the pelvis, when the anterior serous flap is brought over the protruding gauze and stitched to the posterior surface of the vaginal wall or the serous covering of the sigmoid flexure, as the case may be. The gauze pads removed, the intestines and great omentum are placed in normal position; the abdominal walls are closed with tier suture, the abdominal wound dressed, and an aseptic dressing applied to the vulva and the patient returned to bed. The head of the bed is elevated, unless there are symptoms of temporary shock, when this is not done until the patient has recovered from shock.

In making a vaginal hysterectomy I prefer to use clamps rather than ligatures.

THE USE OF ATROPINE IN OPHTHALMIC PRACTICE.

By Aaron Brav, M.D.,
Clinical Assistant to the Ophthalmological Department of the Medico-Chirurgical College, Philadelphia.

It was in 1833 that Geiger Mein and Hess announced that the action of belladonna on the pupil and accommodation is due to an alkaloid which they named atropinum. Atropine is the alkaloid of *Atropa Belladonna*, a member of the family Solanaceæ. It is a yellowish-white, silky, prismatic crystal without smell, having a

bitter, acrid taste. It is soluble in 300 parts of water at 60° F., in 25 parts of ether, and in much less alcohol. It is alkaline in reaction and forms crystallizable salts with acid. The salts of atropine are easily soluble in water, and are therefore suitable for ophthalmic use. The sulphate of atropine is the one more commonly employed. This salt is a white crystalline powder, very soluble in water and alcohol. It is used in ophthalmic practice as a (1) mydriatic, (2) antiphogistic, (3) analgesic, (4) iridoplegic, and (5) cycloplegic.

When a drop of a half-per-cent solution of atropine is instilled into the conjunctival sac its physiological effect will show itself within twenty minutes by a dilatation of the pupil. This effect results from its action upon the terminal endings of the oculomotor nerve. It paralyzes the peripheral filaments of the motor nerves, and according to Donders it has also a stimulating effect upon the sympathetic nerve fibers. The action of atropine is entirely a local one and produces its effect without interference with the center of innervation. That the action of atropine is a local one is proven by the fact that the instillation in one eye will not produce a dilatation of the pupil in the other eye. The action of atropine takes place from its passing through the cornea by diffusion, and getting into the aqueous humor so as to act directly upon the iris. Experimentally this can be demonstrated by instilling a drop of atropine into an eye, and as soon as dilatation occurs the aqueous is evacuated by paracentesis; this aqueous is then instilled into another eye, and dilatation of the pupil is the result, showing that the diffusion takes place through the aqueous and acts directly upon the terminal nerves of the iris.

The quantity and strength of the solution of atropine used depend upon the condition met with. Ordinarily for mydriatic purposes one drop of a half-per-cent solution of the sulphate or salicylate is sufficient. When the iris is congested a one-per-cent solution is employed. To keep the eye in a state of mydriasis, where it is necessary to preserve its mydriatic effect for many days, two or three instillations give the desired result.

The use of atropine as a mydriatic is indicated in all conditions where the iris is congested, and in conditions where adhesions of the iris to the anterior part of the capsule of the lens are anticipated; for diagnostic purposes, in diagnosing posterior synechia resulting from iritis, or in recognizing a seclusio pupillæ, and in differentiating iritis from cyclitis, atropine is of great value. However, in ordinary ophthalmoscopic examinations of the eye, atropine, unless there is some special indication for its use, should not be employed because of the unnecessary visual disturbance of considerable duration to which it subjects the patient.

The antiphlogistic property of atropine makes this drug the most valuable in ophthalmic practice, and is indicated in every inflammatory condition of the eye, except in a few cases which will be discussed later. Its antiphlogistic power depends upon the fact that it relieves the congestion of the iris by forcing the blood out of its vessels into the ciliary vessels, and thus it exerts a beneficial influence on the inflammatory condition. Again, by contracting the iris and paralyzing its motor function, it places the iris in a state of absolute rest, by preventing its to-and-fro movements in response to the stimulus of light, and rest is the most essential thing in all inflammatory conditions. Its antiphlogistic property depends therefore upon its physiological action as a mydriatic and cycloplegic. All inflammatory conditions of the eye accompanied by congestion of the iris are direct indications for the therapeutic value of its antiphlogistic principle.

Atropine also acts as an analgesic, diminishing pain and sometimes completely abolishing it. This it accomplishes not by its direct action on the sensory nerves, but rather indirectly by reducing the hyperemia and by paralyzing the motor filaments, preventing movement of the iris. It has no anesthetic value. As an analgesic its value is only of usefulness in those cases in which the pain is due to the congestion of the iris.

Total paralysis of accommodation is the cycloplegic effect of atropine. Paralysis of the ciliary muscles is accomplished by the action of atropine upon the peripheral nerves, and is more slow than its mydriatic action, requiring about two hours to bring the ciliary muscles into a state of absolute rest. The effect begins to diminish about the fourth day, and is completely lost in about twelve days. It is necessary

to instil two or three drops daily in cases where its cycloplegic effect is required for a few days.

Atropine is extensively used for its cycloplegic effect. In the estimation of errors of refraction in determination of hypermetropia, astigmatism, simple or compound, atropine is of the utmost importance. In deep-seated diseases of the choroid and retinæ atropine is of great service, because it sets the ciliary muscles at rest so that they cease to drag upon choroidal and retinal membranes.

Visual disturbances as a result of the local use of atropine differ greatly and depend entirely upon the refractive media of the eye. When the accommodation has been paralyzed by the use of atropine the ciliary muscles are not able to perform their functions; the eye is then constantly focused for its farthest point. The emmetrope retains distant vision, but must use a lens with a refractive power equal to the paralyzed accommodation in fixing near objects. In low degrees of myopia the visual disturbance is more marked, while in high degrees of myopia the visual disturbance is but slightly noticeable. Most marked is the effect in hypermetropic and astigmatic eyes, since this class of patients cannot see distinctly without using their power of accommodation, so that distant vision becomes indistinct without a proper lens substituted for the paralyzed accommodation.

The effect of atropine upon intra-ocular pressure is still a subject open for dispute and investigation. Various leading therapeutic writers claim that it diminishes intra-ocular tension, while the tendency in ophthalmological circles is to regard atropine as a drug that increases intra-ocular tension. This difference of opinion may depend entirely upon the fact that the physiological action of the alkaloid has been determined by experimenting upon healthy eyes in which diminution of intra-ocular pressure was noticed, while the ophthalmologists gather their information from clinical observation, and it is highly probable that in eyes having already a high tension, atropine increases it. In speaking of intra-ocular tension Fuchs says: "So far observers have not arrived at concordant results in regard to this matter, but at least this much has been proved by experiments, that in the healthy eye that alkaloid causes only very insignificant variations of tension. The case is altogether different when elevation of tension exists, or there is a tendency to it; then atropine may raise the tension very considerably, while eserine and pilocarpine noticeably diminish it."

INDICATIONS FOR THE USE OF ATROPINE.

1. In correcting errors of refraction in patients under forty years, unless there is a contraindication to its use, such as pregnancy, lactation, or a glaucomatous condition, atropine is a useful agent. Various other drugs are employed in testing and measuring refractive errors, but none so effective and productive of good results as atropine. Homatropine is preferred by some because it does not incapacitate the patient for such a long time, but while it is reliable in ordinary cases its use in complicated cases is positively of no avail. In all cases of high degree of hypermetropia, cases accompanied by severe headache or other symptoms resulting from errors of refraction, in cases of astigmatism, simple or compound, hyperopic or myopic, atropine is the most reliable cycloplegic.

2. In spasms of accommodation with a resulting apparent myopia atropine is the drug to employ to clear up the condition. I remember distinctly a case that came under our observation in the eye department of the Medico-Chirurgical College, which had an apparent myopia of —.75; under homatropine it showed a myopia of —.25, while under the influence of atropine a +1.25 hypermetropia was revealed.

3. In the treatment of convergent strabismus, due to an excessive degree of hypermetropia in its early state, atropine is of value, because paralyzing the accommodation, keeping the eye focused for distant vision, it prevents undue convergence.

4. In diagnosing posterior synechia and seclusio pupilla atropine is of considerable value.

5. In various inflammatory conditions because of its many-sided effects it is the most valuable therapeutic agent employed in ophthalmic practice. In keratitis, whenever there is a complicated iritis or hyperemia of the iris added to the corneal inflammation, atropine is indicated. It is a remedy of great utility. It exerts its antiphlogistic effect by contracting the blood-vessels, thus relieving the congestion. For the same reason it also exerts

its anodyne effect, so that with the dilatation of the pupil the pain simultaneously diminishes. Some observers are of the opinion that atropine has a direct sedative action upon corneal lesions, because of the favorable results obtained from its use. It is, however, reasonable to assume that this favorable result is obtained indirectly through its antiphlogistic and analgesic effect. Some there are who believe atropine to be contraindicated in superficial inflammations of the cornea because its mydriatic effect augments the photophobia by admitting more light through the dilated pupil. While theoretically this may be true, yet when we consider and carefully estimate the antiphlogistic and analgesic effect of the alkaloid the balance will be in favor of its employment, especially so when we can by smoked glasses exclude the light. In diseases of the cornea, therefore, of almost every type, from the most superficial defect in the epithelium to the most severe form of suppurative keratitis, atropine is indicated, and is specially of great service in the interstitial and parenchymatous types of the disease.

6. In ulcers of the cornea atropine is of invaluable service. Its important therapeutic value is in keeping the iris away from the cornea, thus guarding against hernia of the iris and its manifold baneful results, in addition to its antiphlogistic and analgesic effect. The objection to the use of atropine in deep ulcers involving the stroma of the cornea is that it raises intra-ocular tension, thus compressing the channels of the corneal tissue, depriving the cornea of its nourishment, and thereby exposing its tissues to further degeneration. Again, in deep ulcers an increase in intra-ocular tension is likely to cause perforation. From the information gathered the increase of intra-ocular pressure is so slight as to be overlooked when we consider the sedative effect of the drug. Atropine is undoubtedly one of the most valuable drugs the ophthalmologist has at his disposal.

7. In the treatment of diseases of the iris and ciliary body atropine is an absolute necessity. It should be used freely and early, until the iris becomes fixed and quiet, and its tissue is freed from both serum and blood. In iritis regardless of its causal factors—syphilitic, rheumatic, or traumatic—atropine is indicated. Iritic pain is relieved by reducing the congestion and by placing the iris at rest through the mydriatic and cycloplegic action of the alkaloid. Its mydriatic action also prevents the formation of adhesions (posterior synechia) when used early. In cyclitis the pain is increased by the use of atropine because of an overengorgement of the ciliary vessels, which while already congested are forced to receive the blood from the contracting vessels of the iris.

8. Diseases of the sclera, wounds, and recent injuries are always benefited by the employment of atropine.

9. Diseases of the uveal tract, choroiditis, retinitis, are also indications for its use, because paralyzing the ciliary muscles it prevents the constant pulling of these members forward.

10. Atropine is also indicated in circular iridodialysis.

CONDITIONS IN WHICH ATROPINE IS CONTRAINDICATED.

1. Glaucoma: in all conditions with an increase of intra-ocular tension, in all cases with a tendency to glaucoma, atropine should be avoided, as it may precipitate an acute glaucoma.

2. In people above forty, atropine for the correction of errors of refraction should not be used.

3. In cyclitis atropine will increase the pain and should not be used.

4. In ulcers of the cornea with impending perforation atropine should be used with the utmost care.

5. In radial iridodialysis atropine is contraindicated.

In the employment of atropine, especially so in children, great care and caution must be exercised. Atropine when used carelessly will cause general disturbances by a manifestation of toxic symptoms. Some people show a marked intolerance to atropine and manifest toxic symptoms after the instillation of a few drops. The toxic effect manifests itself by dryness of the throat, flushing of the face, nausea, accelerated pulse, redness and swelling of the lids. As a rule, however, these symptoms occur only in cases where the drug has been employed for a long time.

It is essential to take proper precautions in the use of atropine. The poisonous effect from the local use of atropine takes place by its passing through the puncta,

canaliculi, lacrimal sac, nasal duct, to the mucous membrane of the nose, from where it is absorbed. Hence to preclude the development of atropine poisoning we have to prevent its running down along with the tears through the nasal canal. To do this it is well to evert the lid while atropine is instilled, so as to allow any excessive quantity to run down the cheek. This is especially necessary in children. The same result can be obtained by compressing the lacrimal sac with the finger.

While using atropine the following points should be borne in mind:

1. The preparation should not be contaminated.
2. The solution should be neutral in reaction.
3. The preparation should not be too strong.
4. While using it the lacrimal sac should be compressed or the lid everted.
5. The solution should be asepticized by a fraction of bichloride, especially when used in inflammatory conditions.
6. The diagnosis must be certain.
7. The eye should not be glaucomatous.
8. No more than three drops daily should be instilled. In children one drop will suffice.
9. It should not be used after forty-five years of age.

With these precautions in mind we can safely say that atropine is the most valuable therapeutic agent in the domain of ophthalmic therapy.

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MEDICAL TREATMENT OF DIABETES.

In the course of an article in *American Medicine* of February 20, 1904, THOMSON tells us that alkalies, in the form of mineral waters, have always held a deserved place in the treatment of diabetes. There is, however, one caution to be always borne in mind, and that is, that the free use of all saline waters should not be ordered for any one who is really losing flesh. In the writer's experience they have done harm to emaciated diabetics.

Diabetes is a very serious disease on one account alone, if not on other accounts, in that it virtually compels a starvation of an essential element of food. The system must have sugar, and if it does not get the sugar which it can use in the food, it will turn to its own proteid for sugar. Along with this profound perversion, poisons begin to be generated, of which oxybutyric acid and its derivatives are doubtless only a part, and which poisoning we are practically unable to neutralize. Our function, therefore, is to put off the evil day of these terminal developments as long as possible, and to do that functional medicines will afford us no help. The essentials of the chemistry of this specific toxemia are yet unknown. The formation of acetone and of diacetic acid occurs early, and the blood itself often changes its color, owing to the abundant presence in it of fatty and proteid granules. Something, however, holds back the carbon dioxide in the tissues, for it is a mistake to ascribe the low percentage of carbonic acid in the blood to hyperacidity, because the blood of those patients when drawn will take up oxygen or carbonic acid about as freely as normal blood.

The last step is the rapid disappearance of sugar from the urine. Why sugar is absent in diabetic coma we do not know, but curiously enough the first danger-signal comes from the kidneys, for before drowsiness begins the urine often deposits an enormous number of peculiar looking casts. To postpone the well-nigh inevitable death in these conditions we can rely upon the most trustworthy diuretic which we possess, namely, prolonged intestinal irrigation with hot normal saline solution, by means of what is conceded to be the best instrument for the purpose, Kemp's rectal irrigator. Hypodermic injections of 7 to 14 grains of camphor in sterilized almond or olive oil answer best to sustain the failing heart, while diluted milk holding all the sodium bicarbonate which the patient can take is the only recourse left for food. Some of the fatal poison doubtless could be washed out, if we could bleed the patient freely and transfuse an equivalent amount of normal saline.

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Leading Articles.

THE TREATMENT OF CROUPOUS PNEUMONIA.

Until some true specific for the treatment of this grave disease is discovered, the profession will never cease to take interest in plans which may be proposed for the alleviation or cure of the malady. Even after a true specific is found a considerable number of patients will die of this disease, because it is often a manifestation of diminished vital resistance depending upon some underlying malady such as Bright's disease or diabetes. Most of the laity, and some physicians, fail to recognize the fact that a disease like pneumonia is in reality a terminal infection which only develops when for some reason vital resistance has become impaired. This is one of the reasons why the malady has so high a mortality, and explains, to some extent, our inability to save certain patients when attacked by it.

There is considerable difference of opinion amongst leaders of medical thought at the present time as to the methods of treatment which should generally be resorted to, but whatever these may be, every one is in accord in believing that the old methods of employing depressing drugs should be entirely cast aside, and that in their place our constant endeavor should be to maintain the nutrition and strength of the patient in order that his vital resistance may be supported to such an extent that he will triumph over the invading microörganisms. To this end small quantities of easily digested or predigested foods should be given at short intervals, and when there are evidences of circulatory failure, stimulants may be administered. It is, however, of vital importance in our anxiety to do good that we do not in reality do harm, and as has recently been emphasized by Dr. Gilman Thompson, the physician frequently makes the mistake of tiring the patient's heart through excessive stimulation. In other words, physicians of the present day have been taught for the last thirty years that one of the chief dangers in pneumonia is circulatory failure, and so they are wont to direct all their energies toward circulatory stimulation, with the result that too much stimulant treatment is given. Indeed, it is sometimes surprising to see how much "treatment" a pneumonia patient can stand. A physician treating a case of this character should, we think, always remember that a full, bounding circulation is not advantageous, and on the other hand, that a moderately weak circulation, if adequate for the patient's needs, may be by no means a cause of alarm. Too frequently the physician gives stimulant drugs when they are not required, and oftentimes he will be surprised to find that the patient's pulse under the influence of the stimulants which he has administered is stronger than his own. Overstimulation is not only a mistake, but it is capable of doing harm, both by causing the heart to exhaust itself through overexertion, and by giving the stomach and liver the extra work of absorption, and the kidneys the extra duty of elimination. It is well to remember that variance from the normal, either above or below what might be called the abscissa line of health, may be equally disastrous. If the pulse is feeble and the heart is weak, it is wise to give stimulants for the purpose of supporting the circula-

tion to the extent that it is raised to approximately its normal level, but on the other hand it is a great mistake to carry the circulation to a point above the normal level, or to give stimulants when the circulation is already excited.

In the paper of Dr. Thompson which we have quoted, and which is published in the *Journal of the American Medical Association* of March 19, 1904, we are glad to notice that he casts the weight of his opinion in favor of certain plans of treatment which we have learned by experience to consider of value. In the first place, he recognizes that different conditions call for different remedies; that strychnine may be needed for certain circulatory depression; that nitroglycerin should be combined with digitalis, if the peripheral vessels are in spasm; and that for sudden collapse, hypodermic injections of camphor, ether, or alcohol are exceedingly valuable. Of the so-called "specific remedies" he has little to say that is good, and he confirms the unfavorable views expressed by Dr. Scott in a recent number of the GAZETTE as to the efficiency of the carbonate of creosote. Alcohol, he thinks, is not a very reliable crutch to lean upon, but oxygen he regards as a very valuable aid in carrying the patient through periods of dyspnea. Concerning hypodermoclysis, he is an earnest advocate, particularly when the respiration is shallow, intermittent, and irregular, the cyanosis is extreme, and the pulse is almost imperceptible, and when there is coma with profound asthenia. To meet these conditions he advises from 600 to 1000 cubic centimeters of hot normal saline solution. Concerning the value of local applications on the chest he has come to the conclusion that they exercise no influence whatever upon the course or outcome of the disease. With this view we are in accord. Strapping the chest, if there is any pleural inflammation, is of course an excellent method of diminishing the pain. Dr. Thompson also believes, as we do, that great care should be taken to prevent the accumulation of gas in the intestines, since tympanites increases the burden of the heart and of the lungs.

Recently we have employed in a number of cases antipneumococcic serum with excellent results, but we doubt whether this serum will ever give the same proportion of recoveries as that which follows the use of antitoxin in diphtheria. The conditions in the two diseases are quite different. Diphtheria, as a rule, attacks young children whose systems have not been impaired by bad habits or by disease, and who are therefore able to rapidly convalesce if the antitoxin can bridge the chasm between illness and health; whereas in pneumonia, as we have already stated, the disease in a large proportion of cases attacks persons already enfeebled by other ailments, and therefore antitoxin has not the same opportunities for doing good. When given early in the disease to an individual not already suffering from some chronic ailment, we can see no reason why antipneumococcic serum should not promise much in the way of aiding his recovery.

THE USE OF OPIUM IN PNEUMONIA.

We publish elsewhere in the columns devoted to Progress an abstract from an editorial article upon this subject which appeared in the London *Lancet* of February 20, 1904. We are desirous of calling attention to this subject because, while on the one hand we can fully indorse some of the opinions expressed in that article, it has seemed to us that its writer has gone to the other extreme, and is perhaps preventing the administration of a drug which in some conditions undoubtedly exercises a most favorable influence. In the first place it is important that we should bear in mind the fact that there is more than one form of pneumonia, and also that pneumonia in each of its forms presents quite a different aspect according to the condition of the patient who is ill. There can be no doubt that in those cases of pulmonary consolidation in which there is in addition profuse bronchial secretion, the use of opium or morphine is distinctly disadvantageous, as it aids the carbon dioxide in stupefying the respiratory centers and the mind of the patient, so that inadequate efforts are made to expectorate the mucus which accumulates in the respiratory passages. Cough, in cases such as these, however annoying it may be, is nevertheless a necessary evil in order that the patient may not drown in his own secretions. In any case, therefore, in which these conditions exist, opiates are manifestly harmful. On

the other hand, we not infrequently meet with cases of pneumonia, and typhoid fever as well, in which an active delirium keeps the patient continually wakeful and restless, so that he exhausts his nervous and cardiac strength by repeated struggles and constant talkative delirium. After this has continued for twenty-four hours or more, the end not rarely comes suddenly, partly from toxemia, but largely from exhaustion. It is in such cases that morphine given hypodermically sometimes saves life, and we have frequently seen its administration so alter the character of the case after a few hours of quiet sleep that the patient was manifestly on the road to recovery. Like many other therapeutic recommendations, we cannot therefore advise the use of opiates in pneumonia in general, for certain conditions may exist which will absolutely contraindicate its employment. But on the other hand we can in some instances employ them with most advantageous results, and the skill of the physician must be employed to decide when they will do harm and when they will do good. It is wrong to say "Use opium always," and it is equally wrong to say "Use opium never."

THE ABUSE OF NITROGLYCERIN AND STRYCHNINE.

On more than one occasion in the past we have called attention to what we believe to be an abuse of nitroglycerin; that is, its employment as if it were a true circulatory stimulant. Not rarely it is administered in cases of sudden cardiac failure and during the course of exhausting diseases with the idea that by so doing a stimulant influence upon the circulation is produced. Such an employment of this drug cannot be based upon clinical experience, and certainly is antagonistic to our knowledge of its physiological action. The only condition of cardiac failure in which nitroglycerin can be of value is when the heart is tired out because of the existence of a high arterial tension which gives it an excessive amount of work to do. We are glad to notice that in an article contributed to a recent number of the *Medical News* by Dr. Le Fevre, and part of which we abstract for this issue of the GAZETTE, he emphasizes the fact that this mistake is frequently made. He asserts that the drug is abused in the treatment of typhoid fever, and that it should only be given when arterial tension is relatively too high for the cardiac power. Finally, he believes that it should not be given continuously for any length of time in typhoid fever. With these conclusions our readers already know that we are in thorough accord.

Another point which Dr. Le Fevre mentions, and concerning which we have not infrequently spoken in these columns, is the abuse of strychnine. We are glad to notice that his experience has been in accord with our own, and that he strongly dissents from the present plan of giving strychnine in heroic doses as soon as typhoid fever is diagnosed. He believes that in these cases much of the restlessness and distress, supposed to be due to the disease, is actually caused by medication, and he asserts that patients who are early stimulated to the full physiological limit by strychnine make a slower convalescence than those who do not receive the drug.

Finally, the point is made that this drug should be reserved until a condition of the reflexes, both cardiac and spinal, shows that the disease has begun to affect the nervous centers, and under these circumstances it may be merely given for short periods of time to overcome conditions of depression.

Some years ago in the editorial columns of the GAZETTE we spoke of this matter in full, and since then we have had our opinion in regard to it confirmed again and again. Not infrequently we have seen a rapid, irritable pulse produced in cases of typhoid fever by the unwise employment of full doses of strychnine.

A FAR CRY FOR ADRENALIN CHLORIDE.

To the THERAPEUTIC GAZETTE has come the first issue of the *Calcutta Practitioner,* a medical journal published in Calcutta, India, which presents as its opening article one which deals with the use of adrenalin chloride in plague and other diseases, by Rai Bahadur Kailaschandra Bose. This clinician believes that adrenalin chloride is a very useful remedy in bubonic plague, as in his experience death is due in many instances to cardiac failure and interstitial hemorrhage. For the purpose of supporting the circulation, he is accustomed to administer strychnine, dig-

italis, and arsenic. A year ago he first added to this treatment adrenalin chloride. At first he only used a single drop of the 1:1000 solution every hour, but later he increased it to two drops every hour, with the result that the patient improved, and finally recovered. Basing his plan of treatment upon this original case, he then treated sixty other cases, with the result that he had a percentage of recovery of 54.2, which while exceedingly low for most diseases is high for plague. He found that given in any stage of the disease it sufficed to maintain the heart and pulse admirably, and seemed also to reduce the temperature. He has also found adrenalin of value for the purpose of reducing enlargement of the spleen due to engorgement in malarial fever. He does not think that it improves the general health, but is confident that it decreases the size of the spleen.

DIVERTICULA OF THE ESOPHAGUS.

By diverticulum of the esophagus is meant a sacculation of the wall of this tube, lined by a practically normal mucous membrane. Such pouching may occur in any part of the esophagus, and may be due either to tractions from the outside or pressure from within. In the former case the traction is exerted by contracting scar tissue, such, for instance, as would result from the healing processes following the inflammatory destruction of the bronchial glands. It is probable that most diverticula, at least those of distinct clinical significance, are due to a combination of causes, having been started perhaps by traction, and subsequently developed as the result of internal pressure.

The purely traction diverticula scarcely ever give trouble, except from the lodgment of a foreign body, perforation, and infection of the mediastinum. Their presence is rarely diagnosed, and the knowledge of their existence is dependent on the autopsy findings. When these traction diverticula are so placed that they become distended by ingesta, they become converted into pressure diverticula, and are then of great clinical significance.

The symptoms of pressure diverticula are sufficiently pronounced to enable the surgeon to recognize their presence. The most characteristic symptoms are difficulty or delay in swallowing food, regurgitation of the same at varying periods, dyspnea, pain, and often cough. Death ultimately results from inanition. Halstead (*Annals of Surgery*, February, 1904), in his admirable paper on this subject, notes that of the twenty-seven cases reported by Zenker, thirteen died from starvation, and eight from intercurrent disease superinduced by the diverticulum. Halstead notes that congenital diverticula are observed in the pharynx, but are probably the remains of bronchial clefts, the starting-point being an incomplete internal fistula that has gradually dilated through pressure, and has assumed the characteristic shape of a diverticulum.

The pharyngeal diverticula are so placed in the lateral wall that while they are characterized by symptoms similar to those dependent on esophageal diverticula, and although the dysphagia is generally not marked, yet the cough and dyspnea are prominent symptoms from the contents of the sac escaping into the air-passages, and from pressure upon the larynx.

The pharyngoesophageal diverticula are, according to Halstead, commonest, and from a clinical standpoint the most important. They develop exclusively in the median line posteriorly, though by pressure they may be pushed to the side. Their point of origin corresponds to the triangular space just below the inferior constrictor, where there is normally a defect of the muscular wall of the esophagus. Also at this point the esophagus is narrowest and is fixed in front.

Diverticula situated between the pharyngoesophageal junction and the upper border of the sternum are rare. At the level of the left bronchus there occasionally occur diverticula, probably incident to a bulging of the anterior esophageal wall which takes place at this point.

Diverticula of the lower third of the esophagus are situated, as a rule, just above the diaphragm, and are given off generally from the lateral or anterior wall of the esophagus.

The symptoms of all forms of pressure diverticula are so like those of stenosis that a differential diagnosis may be difficult. The early symptoms are always those of a slight stenosis, and those sacs which are placed in the upper end of the esophagus form tumors which can be palpated and emptied by pressure.

When the diagnosis is to be cleared by

the skiagraph, the sac should be filled with bismuth mixture, or there should be introduced into it a metallic sound or rubber tube filled with shot. In an attempt to pass a small sound it often happens that it meets with an obstruction which seems absolute, but on change of position of the patient or of the sound the latter will pass readily into the stomach. On occasions a large sound may be introduced without trouble. When the smaller one catches, the contact is most unlike that of a stricture.

The employment of two tubes is found serviceable. One with numerous perforations in its lower end is passed directly into the stomach; the other, with but a single opening at the end, into the esophagus above the cardia. Water, if poured through the second tube, will run down into the stomach through the openings in the first in case of esophageal dilatation. If a diverticulum exists, it will first be filled, before the overflow will reach the stomach. Moreover, the contents of the diverticulum can be returned by the second tube and measured. Jung's method consists in introducing a third smaller tube, with only two perforations at the end, through the first or stomach tube. Thus he can aspirate the fluid from the stomach, giving positive information as to the position of the tube. By allowing clear water to pass into the stomach through the first tube, and a colored solution through the second, and by having the water returned unmixed from the inner or third tube, a positive diagnosis of diverticulum can be made, and dilatation of the esophagus with or without cardia spasms can be excluded.

Palliative treatment of esophageal diverticulum consists in a persistent use of sounds and stomach tubes. The palliative operation of gastrostomy is indicated when it is needful to prevent death from starvation. Excision of the sac is the operative treatment when this is practicable. Halstead quotes Veiel's statistics of 1900, of twenty-three cases operated on; five died, and eighteen recovered. Nearly all operations for the relief of diverticulum are practiced in the cervical region. A lateral incision is made, and is deepened until the esophagus is reached. The sac is freed from the structures adherent to it, and is either inverted into the esophagus in case it be small, or is closed by suture.

Halstead states that the most satisfactory result from suturing is obtained by first passing round the neck of the sac a purse-string suture; distal to this the neck of the sac is temporarily ligated. The sac is then cut away beyond the ligature. The stump is invaginated, and the purse-string suture is tied. Finally the neck of the sac is sutured with catgut, using the Lembert suture, and the defects in the muscular wall of the esophagus are closed by silk suture. A partial closure of the esophagus and the introduction of a stomach tube is strongly discountenanced. At times operators succeed in obtaining primary union of the entire operative wound. In some cases a preliminary gastrostomy has been performed in order to nourish the patient during the course of the healing of the wound.

PENETRATING WOUNDS OF THE ABDOMEN.

In spite of the enormous number of operations performed for the stoppage of hemorrahge and the prevention of peritonitis incident to penetrating wounds of the abdomen, implying as this does prompt intervention on the part of those trained in such abdominal work, there still remains a popular impression, and in the main one well founded, to the effect that when the viscera are opened a fatal result may be expected in the majority of cases. Though a study of current literature might seem to negative this impression, it must be remembered that as a rule only successful individual cases are reported. Therefore in determining what measure of success may be fairly expected at the present day the entire experience of one man is extremely important. This is given by Harris (*Medical News,* Jan. 23, 1904), who reports sixteen cases, with three deaths. One case died from rapid, profuse internal hemorrhage before the source of the bleeding could be discovered and controlled. This might reasonably be excluded as an operative death, as might also the second case, in which fatal termination was due to shock, both lungs and the spinal cord having been injured. These aside, there remain fourteen cases with but one death. This latter was due to peritonitis, and occurred on the third day, the patient having exhibited eight perforations involving the sigmoid and small intestine and transverse colon.

In two of the cases celiotomy showed neither visceral injury nor extensive hemorrhage, hence operation, except for diagnostic purposes, was not needful. In one case, however, the viscera were not injured, but the hemorrhage was profuse, and a fatal termination could reasonably be expected had this not been checked.

Of the eleven remaining cases, characterized by perforation and hemorrhage, the mortality was ten per cent, as contrasted with the sixty or seventy per cent which is usually considered as allowable. This low mortality is attributed by Harris to immediate operation in all cases but one, and to drainage when the gastrointestinal tract had been opened.

The surgeon who waits for symptoms of peritonitis before making a diagnosis of penetrating wound involving the viscera can always expect a large mortality. If, however, it be recognized that there are absolutely no known symptoms which will indicate injury to any of the viscera, except possibly in connection with the urinary tract, stomach, or lower bowel, that all symptoms following such wounds indicate either internal hemorrhage or peritonitis, and that every bullet or stab wound which penetrates the abdominal cavity should be operated upon at the earliest possible moment, any careful and clean surgeon can expect a mortality as low as that reported by Harris.

In regard to the advisability of drainage, strongly insisted upon by Harris, there is a diversity of opinion. His judgment, however, based upon his most successful experience, should carry much weight.

Reports on Therapeutic Progress

THE ADMINISTRATION OF OPIUM IN PNEUMONIA.

The London *Lancet* of February 20, 1904, speaks of this subject as follows in an editorial article:

When pneumonia was regarded as an acute inflammatory affection due to cold it was treated vigorously by bleeding and by purgatives, which without doubt relieved pain and diminished arterial tension. On account of the dry burning heat of the skin diaphoretics were sometimes employed, the most important being tartar emetic. Then followed the group of stimulant expectorants to facilitate the removal of the exudation. But it was soon realized that drugs were scarcely required. Indeed, the extravagant claims put forward for homeopathy paved the way for the recognition of a normal definite crisis in pneumonia independently of active interference, and this in turn was a step toward the subsequent discovery of the presence of microörganisms and to the numerous attempts which have been made to utilize this knowledge. For the present most clinical observers are convinced that with our known resources it is impossible to curtail the duration of the fever, which is, indeed, regarded in some quarters as a natural effort to limit and to control the development of microörganisms. Accordingly, while some, on the self-limited systemic infection theory, think there is nothing to be done, others turn more hopefully to symptomatic treatment.

Of late years there have been many indications of uneasiness concerning symptomatic treatment in pneumonia, and more than one observer has declared his conviction that it cannot safely be pursued on ordinary lines. Many maintain that several distressing symptoms are really conservative in their origin, and that any interference with these may be followed by dangerous results. The pyrexia and the dyspnea of pneumonia would under such reasoning be regarded like the diarrhea of typhoid fever as being beneficial within reasonable limits, and therefore to be checked only when they appear to be excessive. In nearly every case of pneumonia, if symptomatic treatment is to be adopted, there are probably numerous temptations to employ opium or morphine. The severity of the pleuritic pain at the outset seems to demand the adoption of measures calculated to afford relief, and since opium is ordinarily the drug which is relied upon for this purpose, it is probably the one to which thoughts will first turn. It is, moreover, the drug which is definitely recommended in many text-books and works of reference. The favorite text-book distinctly advocates the hypodermic injection of morphine for the relief of the stitch in the side at the onset of pneumonia, and further recommends that when the disease is fairly established Dover's powder should be

given to check cough and so to alleviate pain.

Nearly two years ago reference was made to Sir William T. Gairdner's view of the extreme danger of opium in pneumonia. In a paper published in the *Glasgow Medical Journal* for April, 1902, he maintained that the safety of the patient depends upon the respiratory nerve centers being kept, as it were, "wide-awake." His views have recently received confirmation from Dr. Stephen Smith Burt, who discusses the purposes for which opium has frequently been administered in pneumonia and gives his reasons for regarding it as a dangerous drug in this disease. He mentions its employment to relieve pleuritic pain, but for this purpose strongly advocates the local application of an ice-bag, or a hot poultice, or strapping the affected side of the chest, or if these fail he recommends dry-cupping, using a large common tumbler. With regard to the administration of opium to allay cough he pertinently remarks that the average cough of pneumonia with expectoration for obvious reasons should be rather promoted than suppressed. Similarly he contends that when given in this disease to quiet restlessness opium is prejudicial, since under these conditions restlessness is preferable to somnolence. Dr. Burt reminds us that opium, except in doses that are infinitesimal, depresses and finally paralyzes the centers of respiration, and that it checks every secretion save that of the integument. He holds that in pneumonia the existence of the patient depends upon a maintenance of the integrity of the respiratory center, together with the powers of elimination. Sir William Gairdner in the paper above referred to said he had repeatedly seen toxic symptoms from very moderate doses of opium in certain stages of pneumonia, and that, especially toward the crisis, he had learned to dread it more than almost any other drug. In view of this experience it is interesting to note that the fatality mentioned by Dr. Burt resulted from the hypodermic injection of morphine when the patient was apparently on the road to recovery—that is, presumably, just before the crisis. The facts and arguments against the employment of opium at this stage seem so strong that they demand thoughtful revision of the recommendations at present to be found in text-books; greater emphasis should be placed upon the risks incurred, except possibly at the onset of the disease, and greater stress might well be laid upon the amount of relief which is then frequently afforded by the local application of ice or by the abstraction of blood by leeches. The immediate ease which results from the use of morphine for pleuritic pain in pneumonia should not entail disregard of warnings against its employment based on experience and on reason.

THE THERAPY OF HEMOGLOBINURIC FEVER.

"Hemoglobinuric Fever, its Distribution and Etiology," is the title of a pamphlet by Mr. J. Wallace Collett, medical officer, Southern Nigeria. During recent years much light has been thrown upon the etiology of malaria and other tropical diseases, but comparatively little is known concerning the causation of hemoglobinuric or blackwater fever. In this brochure Mr. Collett reminds his readers that at the present time two theories are propounded as to the etiology of this disease, one being that there is a relationship between blackwater fever and malaria, and the other, initiated by Veretas and Tommaselli and revived by Koch, that blackwater fever is nothing more nor less than poisoning by quinine. Mr. Collett gives his reasons for believing that neither of these theories satisfies the demands of science "sufficiently to be placed upon the category of probable facts or even plausible speculations." He considers, however, that there are several occurrences, both clinical and within the pale of bacteriological research, which would appear to encourage the idea that blackwater fever, if not a disease *sui generis,* is at least intimately connected with a class of diseases due to the infection of the system by a poison probably of a protozoal nature.

Mr. Collett then proceeds to make some remarks on the probable nature of the toxin in this disease. He draws attention to the action of hemolysins, and naturally suggests that with a view of discovering the cause of hemoglobinuric fever it becomes necessary to look for a lysin which can produce the symptoms of the disease and which is not found in other

pathological conditions. This is the proper course to pursue when searching for a pathogenic organism as a causal factor in any particular malady. Mr. Collett then refers to the bacillus megatherium, which was first discovered in a fermenting infusion of cooked cabbage leaves and afterward in samples of papain and infusions of hay, grass, and other vegetable matters. This bacillus has been proved to possess distinct hemolytic powers. In alkaline broth, grown at a temperature of 99° F., this property is strongly developed, and it has now been shown to be due mainly to an extrabacillary elaboration termed distinctively megatheriolysin. Mr. Collett very rightly points out that the occurrence of the bacillus megatherium in decaying vegetable matter is a fact full of significance for West Africa, where vegetation is so rankly luxurious. This organism has generally been considered as non-pathogenic, but it has now been proved to be capable of elaborating products which, in susceptible animals, possess the power of bringing about such profound blood changes as hemoglobinuria. His suggestion, therefore, that there may be a causal relationship between this bacillus and hemoglobinuric fever is a plausible one, but further investigation is, of course, necessary before any definite assertions can be made.—*Lancet*, Dec. 28, 1904.

THE OPEN-AIR TREATMENT OF BRONCHOPNEUMONIA COMPLICATING WHOOPING-COUGH.

In the *Scottish Medical and Surgical Journal* for January, 1904, KER advises this plan of treatment. He thinks after trying that as regards the relative severity of the cases treated there is no doubt at all. Many cases were admitted cyanosed with temperatures of 103° or 104° F., respirations of 60 to 80, and pulse running from 140 to 170. Even in the favorable cases these symptoms continued for a long time, though the pulse and respiration rate slowly decreased and the cyanosis rapidly disappeared.

For purposes of comparison the author has divided his cases into various periods. These periods he decided upon before he had any idea how the figures would work out. He had not realized how far the treatment affected the death-rate till fully two years after it was first commenced, though it was obvious the cases did better. Starting with a hospital death-rate of 71 per cent, calculated on two series of consecutive cases prepared for him by his assistants (and these were no worse than the average), we pass on to the period which the author has named the "transition period," in which the rate falls to 54 per cent. This was the period in which the first attempts at the treatment were made. It includes a group treated entirely indoors, and a second group, the members of which had not had the advantage of the new conditions till they had already been some time in the hospital. In spite of this the second group had little more than half the mortality of the first. The next period includes the cases treated during the summer of 1901, in which all bronchopneumonic cases had the benefits of the new treatment from the day of admission. The rate falls very markedly at once to a little over 26 per cent. During the winter months in the sanatorium the rate was only one point higher. In the summer of 1902 all the pneumonic cases were treated outdoors as far as possible, and the sanatorium was used for the worst cases to sleep in at night. One would have expected a still further fall, but there is a rise to 34 per cent, possibly due to the damp weather, though it is not known if it was really worse than in the preceding year. A very marked rise is again noted when for reasons of administration the whooping-cough cases were moved to wards where no sanatorium was available. In the winter months under indoor treatment the death-rate was 57.8, a figure which, if not as high as the calculated hospital average, offers at least a great contrast to that of the open-air treatment. The improvement in the indoor rate the author attributes to the fact that they had learned not to be afraid of free ventilation.

The author gives in a second table the death-rate of all the cases he included in the first, divided into two groups: the first of those treated indoors; the second of those which from the first, or after indoor treatment, had sooner or later the benefit of treatment under the new conditions. The difference in the rates is again very marked.

Small numbers of cases give misleading results, and also figures can be twisted into meaning anything or nothing. But the author has endeavored to avoid fallacy as far as possible by dividing the cases into groups, before attempting to ascertain what the results would be. He found, as might be expected, that there are fluctuations in the death-rate. But broadly speaking, whereas under the old condition two out of three children who suffered from bronchopneumonia died, under the new two out of three recovered.

THE TREATMENT OF EDEMA OF THE LUNGS.

OWEN states in the *British Medical Journal* of January 2, 1904, that the administration of "expectorants" still forms the staple of current treatment of bronchial catarrh. Drugs that augment the fluidity of bronchial secretion or increase the activity of the expulsive cough are rationally indicated in dealing with such an affection. For ridding the lungs of edematous fluid "expectorant" action is no less obviously useless; edematous effusion is nearly always a thin fluid and is in a situation from which it cannot be expelled by coughing. The clearing of the air sacs is chiefly the work of the absorbent vessels. How much of the task of absorption may fall on the veins is not defined; it seems at least reasonable to assume that the bulk of it falls on the pulmonary lymphatics, which deliver into the great veins at the root of the neck, and the efficiency of their discharge is therefore affected by the degree of blood-pressure in these veins, which in its turn depends on the efficiency of the right side of the heart. A careful investigation of the right side of the heart is therefore an important preliminary to the treatment of edema of the lungs, particularly as the right ventricle, even if previously healthy, is liable to give way before the strain of any sudden and severe obstruction to the pulmonary circulation. The signs of dilatation of this ventricle, undue extension of dulness to the right of the sternum, displacement of the apex beat to the left, the presence of a heaving impulse over the middle of the heart, coupled with blunting of the apical beat, or the transference of the most marked impulse to the epigastrium, must be looked for. Of even greater importance is it to note the presence of any direct evidence of obstructed venous circulation, such as may be afforded by distention of the jugular veins.

If these signs are present and the conditions are at all urgent, venesection should be resorted to without hesitation. The letting of blood may be practiced without fear; but we are not sure the large amounts sometimes recommended are really necessary. The removal of 10 or even 6 ounces of blood has in some cases seemed to do all that is necessary. In very urgent cases, however, it is safe to go to 15 or 20 ounces at once.

The relief afforded by venesection is often very marked; not always as speedy as would be the case were the relief of the right ventricle the sole question at issue, but as speedy as can be expected on the assumption that absorption of some portion of the edematous fluid is the actual means of relief.

Failing venesection, other less efficacious methods of reducing the venous pressure may be resorted to. The application of six or eight leeches over the front of the chest is in some cases attended with good results, though less marked than those furnished by venesection. We may, further, use with effect free watery purgation, by means of elaterin, jalap, or gamboge. Diuretics are practically useless; a hot-air bath is not always applicable, and the only other really efficient sudorific (pilocarpine) is contraindicated by the probable state of the heart. Also dry cupping, as it is recommended by some authors, may be mentioned.

When marked dilatation of the right ventricle has existed, some damage to the left is nearly certain to have followed. On account of both ventricles bleeding should be followed up by the administration of digitalis, digitalin, strophanthus, canvallaria, or squill, to aid in restoring the tone of the stretched cardiac wall. None of these drugs are likely to be of avail unless any serious engorgement of the right side that may exist has previously been relieved by more direct means; but in lesser degrees of dilatation, unaccompanied as yet by urgent symptoms. one or other of them may suffice to overcome the cardiac difficulty without resort to the removal of blood.

Though isolated doses of alcoholic liquors, particularly brandy in hot water, are often of service as temporary stimulants, particularly in the early hours of the morning, when the forces of the heart and of the respiration are at their minimum, the continuous administration of alcohol when edema is present in the lungs is always useless, in the author's experience, if not actually injurious. Oxygen will, of course, find a place in the plan of treatment. The reasons for employing it are so obvious that they need not be enlarged upon. The effects, it is true, are only palliative; but then a mere postponement of complete asphyxia may be of cardinal importance in the case. The use of atropine and ammonia as stimulants to the respiratory center is at least indicated by theory if not fully confirmed by practice, and may be employed without risk. The author was in the habit of administering potassium iodide in these cases at one time, on account of its alleged "absorbent" properties, but he has seen no reason to think that it has any good effect.

One drug, and the most important of all, has not been mentioned. The writer has so often seen marked and speedy improvement, accompanied by a corresponding clearing up of the characteristic signs, follow the administration of strychnine by hypodermic injection in cases of pulmonary edema that the connection can scarcely be accidental. How the strychnine acts he does not pretend to say; its effects are equally observable in slight cases and in severe ones, he claims, in cases apparently independent of cardiac dilatation, and in cases accompanying it. For some years past the author has regularly resorted to this mode of treatment almost as a matter of routine, as soon as any signs of serious edema of the lungs appear, to whatever cause they may be due.

ERGOT IN ALCOHOLISM, MORPHINISM, AND THE GENERAL CLASS OF DRUG-HABIT CASES.

LIVINGSTON in the *New York State Journal of Medicine* for January, 1904, gives his experience with this drug in these difficult cases. The study of this class of cases and of nervous irritability and excitability in other classes has led the author to the positive conclusion that the nervous symptoms depend directly on a disturbance of the vascular system in the nerve centers, and that the circulatory disturbance is due to paralysis of the sympathetic or vasomotor centers.

The logical conclusion is therefore that the prime indication is to tone the relaxed, dilated vessels and bring about as promptly as possible an equilibrium of the circulation. There are several methods by which this result may be wholly or partly secured.

1. Cold to the head and spine by means of ice-cap and spinal bag, or hot followed immediately by cold sponging of the spine, repeating these alternately half a dozen times or more, and such séance several times a day.

2. Galvanization of the chain of sympathetic ganglia by use of the hand electrodes, stroking from occiput to sacrum, the electrodes one on either side of the spine, and separated about four inches from each other. The quantity of current should be 10 or 15 milliamperes and continued for twenty minutes. This should be followed by a similar application of five minutes each over the upper, middle, and lower cervical sympathetic ganglia; or the static current may be used, and the writer particularly recommends a prolonged application of the static wave for half an hour or more to the whole length of the spine with a spark-gap of five to eight inches, and this séance followed by sparking over the lines of the sympathetic ganglia.

3. Dry-cupping over the entire spine and including the sides of the neck, not with the old-fashioned alcohol cups, but with the modern valve-cups which are emptied by means of an air-pump.

4. Massage, which, properly applied by a skilled masseur, is certainly of much service in stimulating the general circulation, and therefore in relieving congested areas.

5. And last, but by no means the least effective method, hypodermic injections of ergot. While the other methods may be effective, the author presents this one as the most certain and the most prompt in its action, and he makes this assurance not only upon many practical demonstrations, but upon two grounds that he thinks will appeal to common sense and to reason: First, because the rationale is correct.

Disturbed function, whether of nerve centers, special organs, or glands, is directly dependent on altered states of the circulation in them, especially as to the caliber of the blood-vessels, a hyperemic state existing, due to the relaxed and stretched muscular coat. This condition can be thoroughly corrected only by so toning and strengthening the relaxed muscular tissue that it will contract and bring the vessels to their proper caliber, thus dispersing to other parts the excess of blood they had contained. Ergot contracts the sort of muscular tissue of which the muscular coat of the blood-vessels consists, but its most pronounced action is upon those areas of such tissue as are weak, relaxed, and stretched, and therefore upon the dilated blood-vessels. When the dilated vessels in any part have contracted the disturbance of function which they produced in that part ceases.

MODERN MANAGEMENT OF INFLAMMATION OF THE MIDDLE EAR AND CONTIGUOUS STRUCTURES.

LEWIS contributes an article on this theme to the *Buffalo Medical Journal* for March, 1904. He thinks that if an acute middle-ear inflammation can be treated early enough, incision of the drum may be avoided, but the ordinary measures recommended in the books are not effective. While sometimes useful, local depletion has usually but little effect on the deeper congestion, and the preparations of laudanum or other anodynes serve but to mask the real condition.

The local treatment found to be of greatest value in acute inflammation before pus has formed is the following:

℞ Cocaine hydrochlorat., 1 part;
Adrenalin chloride, 2 parts;
Glycerinæ, 4 parts;
Aquæ dest., 30 parts.

Sig.: Warm and drop in the ear every half-hour, or oftener if necessary.

The adrenalin constricts the vessels, and helps in the absorption of the cocaine, which of itself is not taken up freely by the dermal drum surface. The glycerin causes a serous transudation, still further relieving the congested vessels, and the combination which is based upon the known action of the drugs will give relief from pain almost immediately when other medicaments seem to be wholly inert.

The treatment of chronic discharges is again a serious matter. Whether or not we are to have a chronic flux will depend in no small degree on our treatment of the primary inflammation. If a free opening extending to the bottom of the tympanum be made in the membrane and the ear be cleaned with a mild antiseptic, the cessation of the discharge will probably be followed by a healing of the wound and a complete restoration of the integrity of the membrane. If, on the other hand, the incision is small or the membrane be allowed to rupture from the pressure of the contained secretion, the wound is often a jagged tear, the discharge erodes its edges, and shortly a tympanic opening results which from its nature will prove difficult, if not impossible, to close. The reasons for the difficulties met in controlling a chronic suppuration from the middle ear are due to its anatomical form, and a failure to bear this in mind when its treatment is undertaken. The form of the external auditory canal, it will be remembered, is that of a curve. The highest portion is usually in the middle. A perforation in the drumhead is often not quite at the bottom, and even if it is at the lowest part of the canal the tympanum sinks a little below its edge.

If now a chronic inflammation involves the secreting surface of the tympanic cavity the mucous discharge settling in the bottom of the warm, moist nest forms a perfect culture medium for the various infectious germs that readily gain entrance through the perforated membrane. If, as is quite common, syringing be employed, either by the patient or the physician, under usual conditions a little lake is left behind, and this very soon becomes alive with the various cocci that have not been destroyed, and that grow and multiply even more rapidly than before.

It is therefore surprising, in view of this palpable and self-evident fact, that so great an otologist as Bezold, in a recent article in the *Archives of Otology,* translated by Dr. Arnold Knapp without comment, should decry the most reasonable and efficient method of treatment yet devised—*i.e.,* the wide siphon drainage. In this paper he insists that the gauze becomes saturated and offensive, and by its retention acts as a septic poultice, increasing the condition which it is designed to re-

lieve. This would, of course, be true if the very essence of this method were not in the frequent replacement of the gauze. Its method of action can be more graphically shown by a sketch than by a description.

If the gauze be applied in this manner after thorough antiseptic cleansing of the external and middle ear, followed by drying with absorbent cotton, the pus is drawn from the middle ear, which is left in the best possible condition for normal healing. Every detail, however, must be carefully considered. If a granulation exist it must be dexterously removed by cautery, forceps, or snare.

THE POISONOUS CONSTITUENT OF TOBACCO SMOKE.

The gaseous products of the incomplete combustion of tobacco, whether it be smoked in the pipe, cigarette, or the cigar, are so complex that the question, To which constituent are the toxic effects of tobacco smoking precisely due? remains unanswered. Of course, it is well known that nicotine is a powerfully poisonous constituent of tobacco leaf, but it is by no means certain that the alkaloid reaches the system by way of the smoke in sufficient quantities to act seriously as a poison. To begin with, the amount of nicotine in tobacco is very small, and there is reason for believing that the quantity given in previous analyses has been considerably over-represented; moreover, though a volatile poison, nicotine does not occur in the free state in tobacco, but as an organic salt, which is not volatile, and which probably breaks up readily on combustion. It is doubtful whether a seventh part of the total nicotine in the tobacco reaches the mouth of the smoker, and some investigators deny that any nicotine occurs in tobacco smoke at all. But assuming that nicotine is the toxic constituent of smoke, the quantity must be quite minute, since in most mild tobaccos the proportion is rarely over one per cent. On the other hand, the incomplete combustion of tobacco gives rise to the formation of aromatic compounds, oils, bases, amines, and gases, some of which are undoubtedly poisons, and these are obviously produced in a far larger amount compared with the quantity of nicotine in tobacco.

In this connection too little attention seems to have been paid to the relatively large quantity of the poisonous gas—carbon monoxide—in tobacco smoke. When the insidious nature of this gas is considered its absorption in the system, which must be very rapid when inhalation is practiced, would sufficiently explain the train of poisonous symptoms which excessive smoking is apt to set up. In some particulars the physiological action of nicotine and carbon monoxide is similar. The dizziness and stupor, the trembling of the limbs and the hands, the disturbance of the nerve centers and of the circulation, palpitation on a slight effort, and the feeble pulse may be the indications of either carbon monoxide or nicotine poisoning. But since one ounce of tobacco gives no less than one-fifth of a pint of pure carbon monoxide gas when smoked in the form of cigarettes—and probably as much more in the form of cigars or in pipes—it is not improbable that to a very large extent these symptoms are due to the carbon monoxide.

We have recently tried the following instructive experiment which bears upon this point: Two or three mouthfuls of tobacco smoke from a cigarette were shaken up with a few drops of blood diluted with water in a bottle. Almost immediately the blood assumed the pink color characteristic of blood containing the gas, and further observations with the spectroscope confirmed the presence in the blood of carbon monoxide. Similarly a few mouthfuls of smoke from a pipe and a cigar were tried, and the results were even more marked. In this experiment we have some explanation in particular of the evil effects of cigarette smoking, for it is chiefly cigarette smoke that is inhaled—an indulgence by which the poisonous carbon monoxide is introduced directly into the blood. This effect of tobacco smoke upon the blood appears to be of considerable significance.—*Lancet*, Jan. 2, 1904.

THE TREATMENT OF TYPHOID FEVER BY ANTITYPHOID SERUM.

To the *Medical Record* of January 16, 1904, EINHORN contributes his results from using this serum. In perusing the author's table and the histories the following conclusions may be drawn with re-

gard to the serum treatment of typhoid fever:

1. In most cases the disease does not seem to have been materially shortened.

2. Either on the day after the first or on that after the second injection a marked reduction of fever usually occurs; this is about one to two degrees lower than previous remissions and lasts longer. The general condition, especially the sensory and nervous symptoms, is much improved, so that grave complications, such as sleeplessness, headache, restlessness, delirium, disappear nearly entirely.

The serum treatment of the cases in question was begun rather late, usually from the ninth to the fifteenth day. We may expect the results to be still better if these injections can be practiced still earlier. Chantemesse is certainly right in recommending injections, even in cases that are only suspicious of typhoid fever, before the diagnosis is certain.

The author's material is too small to allow far-reaching conclusions. This much, however, can be asserted, that the serum treatment of typhoid fever temporarily reduces the fever and improves the general condition, so that patients go through a more rapid and safer convalescence. The injections do not seem to be connected with any dangers. With the many injections given he never had any serious trouble; in two cases a passing erythema of the skin was observed at the point of injection, and in one case chills used to follow for from one-quarter to one-half hour. Abscesses were never observed. The author therefore believes that the serum treatment of typhoid fever is now already of decided value. There is no doubt that we shall soon have more potent sera, with which may be obtained more favorable results. At all events the treatment originated by Chantemesse certainly means a lasting progress in the treatment of typhoid fever.

A CASE OF POISONING WITH HYOSCINE HYDROBROMATE.

GIVEN reports a case of this character in the *Lancet* of January 2, 1904. He was hurriedly summoned to see the case, and was informed that the patient had received a teaspoonful of the medicine half an hour ago (this was confirmed by the amount absent from the bottle). After swallowing it he undressed and got into his bed. While undressing he remarked to his wife that his throat felt very dry, and she noticed that his speech was rather thick. Two or three minutes after he got into bed his wife heard him breathing very deeply; she tried to rouse him but could not, and sent for the writer, who found him deeply comatose, with stertorous breathing and flushed face. His pulse was 80 per minute and regular, his pupils were dilated and equal, and the conjunctival reflex was very slight. He could not be roused by any means. One-tenth of a grain of strychnine was injected hypodermically, and one ounce of brandy given by the rectum. After an hour and a half there was no improvement; the coma if anything was deeper, the conjunctival reflex was quite absent, the pulse was smaller and weaker, and there was some twitching of the arms and legs. The writer sent for his siphon stomach-tube and for an assistant to help him. In the meantime he injected one-sixth of a grain of morphine with one grain of caffeine citrate. In a few minutes the pupils became less dilated, but otherwise there was no change. An hour later, with the help of his assistant, he washed out the stomach by the siphon tube with hot water, removing a small quantity of partially digested food, and then passed into the stomach about eight ounces of strong, black coffee and one ounce of brandy. At 1 A.M., an hour and a quarter later, the conjunctival reflex began to return, and the patient flinched on pinching the skin on the inner side of the arm. Improvement slowly set in, the breathing became less noisy, and the pulse fuller and stronger. At 3 A.M. he could be partially roused for a moment by pinching and shouting, but at once relapsed into a somnolent condition; the pupils now reacted to light. At 5 A.M. he made an attempt to speak and swallowed some coffee. At 8 A.M.—that is, eleven hours after taking the dose—he was really conscious and able to speak for the first time, and he thenceforth made an uneventful recovery.

The prescription, which was for 1/200 of a grain of hyoscine hydrobromate in one drachm of water, with orders to send two ounces, was dispensed at a very trustworthy druggist's, and a very unfortunate

and dangerous, though instructive, mistake made in dispensing it. The druggists in question gave the writer every facility for investigating the matter. It appears that they had two establishments; at the one to which the prescription was taken they had no hyoscine in stock, so the dispenser sent a written message to the other place for 0.08 gr. of hyoscine hydrobromate in two ounces of water, which is equal to 16/200 of a grain, the exact amount he required for the whole bottle of medicine. The dispenser at the second shop, seeing that decimals were used, took it for granted that it was a foreign prescription, and that "gr." stood for grammes, and sent 0.08 gramme, which the first man sent to the author's patient. The result of this was that he got more than fifteen times as much as was intended, or about 1/12 of a grain. This appears to be a good object-lesson in the danger of the present condition of weights and measures in the Pharmacopœia, where it is now optional for either the decimal system or the apothecaries' measure to be used. Surely the time has come for the rational and scientific metric system to be enforced as the official standard.

The literature of hyoscine poisoning seems to be scanty, and points to the fact that the drug is rather uncertain in its action, sometimes producing poisonous symptoms in very small doses, while in other cases fairly large doses are tolerated. This is probably due to variations in its purity and mode of manufacture. Professor J. Dixon Mann, in his work on Toxicology, states that in one instance 1/40 of a grain taken by the mouth produced severe symptoms of poisoning, as did 1/30 of a grain given hypodermically in another. On the other hand, Allan Gray reports a case where 1/50 of a grain was used every night with good effect. Dr. L. A. Weatherly, who used it largely in asylum practice, in an article in the *Journal of Mental Science* for July, 1891, states that he considers that the dose should be from 1/300 to 1/100 of a grain, very cautiously increased in some cases to 1/50. With regard to antidotes, besides those used in this case pilocarpine has frequently been employed. While the writer had it with him he confined himself to the use of strychnine, morphine, and caffeine, the last both hypodermically and as strong coffee, and it is in a great measure, he believes, to the last drug that the patient owes his recovery.

THE TREATMENT OF NEURALGIA BY INJECTIONS OF OSMIC ACID.

In the *Medical Chronicle* for February, 1904, WRIGHT gives the following facts in regard to this plan of treatment:

It appears that Billroth and Neuber were the first to employ osmic acid for neuralgia. They used repeated injections by puncture through the skin without exposure of the nerve; as many as twenty injections were given in some cases. Eulenberg, employing a similar method, got good results in only three out of twelve cases, which included neuralgias of the brachial, sciatic, and trigeminal nerves.

Schapiro, who used a one-per-cent solution of osmic acid in glycerin and water, records five successes out of eight cases at periods two to six months after injection.

Jacoby claims eight cases of cure out of eighteen sciaticas, and warns us that it is "dangerous to implicate a motor nerve."

Fränkel, of Hamburg, found experimentally in animals destruction of axis cylinders and degeneration of white substance with epineuritis and myositis as the result of his injections.

Cohen, of Philadelphia, used repeated injections, "without exposure," into the sciatic nerve, using as much as 30 minims of a one-per-cent solution.

Ellis records the occurrence of some irritation after injection into a thumb in which pain followed a strain.

Merces injected deeply and repeatedly into the sciatic region, with temporary relief and no ill effects.

Franck obtained three successes by direct injection, and Turner records a case of trigeminal neuralgia of two years' standing in which he injected the infra-orbital, and after ten days relief followed, and lasted six months—*i.e.*, to the date when the patient was last seen.

In November, 1899, Mr. (now Sir) William Bennett recorded eight cases of trigeminal neuralgia, one of painful stump, and one of painful median nerve after a wound. He exposed the terminals

in the trigeminal cases and injected 1½-per-cent solution. His first case was in 1897, and his results range from 2½ years' duration downward. Delay in relief and slight relapses occurred in one or two, but his cases all showed good effects, and it is to his paper that the author is indebted for his first acquaintance with the method.

It will be seen that most of the surgeons who have used osmic acid have injected it more or less at random without exposing the nerve trunk. Such a method is quite sufficient to account for irregular and defective results, and it is also remarkable that so little is said of any ill effects considering the very marked changes that osmic acid produces in the tissues, as shown experimentally by Fränkel and observed by the writer in a case in which he repeated the injection, and on removal of a portion of muscle which had been attacked by the acid Dr. Charles Melland found marked degenerative myositis. In all his cases the writer has exposed the nerve and injected a 1½- or 2-per-cent watery solution into the trunk or its branches; sometimes the injection has been both toward the periphery and toward the center, and the acid has generally escaped more or less freely into the tissues immediately around the nerve.

Most of his cases are much too recent to attempt to draw any conclusions as to the permanent value of the method. It is further impossible to eliminate the effect of the exposure and the mechanical results of manipulation and puncture of the nerve, and in some cases of unintentional section by the trephine. It is clear, however, that if this method is employed the nerve should be fully exposed, and not merely a chance injection made through the skin. The author believes also that the immediate results in his cases, as regards both harmlessness and at least temporary relief, quite justify the use of the plan before resorting to any such severe procedure as excision of the Gasserian ganglion. In short, the author believes the method should have a further and extended trial. It will be seen that he has preferred to expose and inject the trunk in some cases rather than to deal with the terminals only, and this is a point that requires to be settled, since the severity of the one procedure is of course much greater than that of the other. It is also of importance to remember that delay in relief may occur—*i.e.*, that pain may continue for some days or even longer after the injection and then pass off. So that it is not necessary to assume failure or to repeat the operation until time has been given to make sure that it is necessary.

A STRANGE RESULT OF IODOFORM DRESSING.

McNAUGHTON-JONES writes of a case in which iodoform produced an untoward effect, in the *Medical Press* of February 24, 1904. He reminds us that the local toxic effects of iodoform occasionally result in cutaneous conditions which are more or less serious, according to the extent of their invasion of the skin and their spread to other parts. The more common are general redness and swelling of the skin of the abdomen and down the thighs, sometimes extending from the trunk to the upper extremities, the eruption being very similar to that of scarlet fever. In several cases it has been associated with a fine vesicular eruption, principally affecting the region of the wound. Other observers have had cases in which the vesiculation has extended into the deeper layers of the skin, resulting in considerable edema, and in some instances in a sanguinolent effusion resembling superficial gangrene.

A patient, aged thirty, on whom he recently operated for retroversion of the uterus by ventrosuspension, at the same time resecting an ovary, was progressing favorably until the third day after the operation. She then complained of irritation, and some smarting in the neighborhood of the wound, which had been stitched with celloidinzwirn, a pad of moist sterilized 10-per-cent iodoform gauze being placed over it, and covered with coeletin. On raising the dressing the nurse found some slight swelling and redness along the area of the incision. On the following day, when the wound was examined, the redness had extended to a considerable area, and the entire surface of the skin for a few inches at either side was vesicated. Attributing the condition to the iodoform, this was removed,

and the wound lighly sponged over with some weak formalin solution, dried, and dusted with the subgallate of bismuth, covered with plain sterilized gauze, and protected with coeletin. The distress continued, and on removing the dressing the next day several large vesicles were found, like those raised from an ordinary blister. One or two had burst, and the others were opened, and a quantity of serous fluid evacuated. There now appeared on the arms and hands some eczematous vesicles, and also a papillary eruption here and there, which was attended by great irritation. Much the same condition followed on the legs. The palms of the hands became red, and finally desquamated. Some three days later fresh vesicles appeared in the neighborhood of the wound. There were no constitutional symptoms, and the range shows that there was but slight elevation of temperature on a few occasions, while the pulse remained normal. The skin healed by first intention, the suture being removed on the eleventh day.

Inquiring into the history of the case, it appeared that many years previously the patient had had an ulcer on the leg. This had been dressed with iodoform, when much the same effects had followed, the leg becoming edematous, and a slough, extending some distance up, leaving an extensive cicatrix. The effects of the dressing were not discovered until after the toxic consequences had resulted. From her childhood she had suffered from an eczematous tendency, and there were symmetrical palmar patches of dry eczematous desquamation of long standing on the hands.

She left the home perfectly well at the end of the fourth week, with only some remains of the eczematous condition in parts.

This case is peculiar in the large blebs, somewhat like those of pemphigus, that appeared in the neighborhood of the incision. One cannot help pondering on the consequences which would have followed in such a case had vaginal hysterectomy been performed, and the vagina tamponed with iodoform. The wound was photographed when the vesiculation was at its height, but unfortunately, owing to defective light, the photograph was not successful. One thing is clear—it is worth while inquiring, in any abdominal or pelvic operation in which iodoform is likely to be used, whether the patient has been subject to any cutaneous affection, and if so, to substitute another dressing for that of iodoform.

THE TREATMENT OF ARTHRITIS DEFORMANS.

McCRAE, of Baltimore, states in the *Journal of the American Medical Association* of January 9, 1904, that in the discussion of this matter we are again met with the fact that there are two great groups of cases, the early and the late. The treatment in the first may undoubtedly be of great help as a preventive measure of farther damage. In the latter condition it can be only palliative, although even here much good may be done. We may first discuss the treatment of an acute attack. Patients are better at rest, and probably it is well to keep them clothed in flannel. If there be much fever the diet should be liquid. Ordinary attention should be given to the bowels. For remedies for the pain we have found that salicylates are of comparatively little use. Antipyrin in doses of five grains is often effectual. Guaiacol is highly recommended by some. Small doses of codeine may be used; morphine seems to be rarely required. Of local measures to the joints the ice-bag sometimes gives considerable relief, or the wrapping of the joint in cold compresses surrounded by oiled silk. These may be kept on constantly. Oil of wintergreen or lead and opium lotion applied locally is of some help. The hot-air baking very often gives relief to the pain. Gentle massage may be of use. In spite of all measures, in some cases the patient is but little relieved.

After an acute attack, whether the patient be absolutely free of symptoms or has some damage left in the joints, the great principle of treatment seems to be keeping up the nutrition. The patients should be out-of-doors as much as possible. They should be given all the nourishment they will take, and this of a general kind. The mistake is too often made in considering these patients to be rheumatic or gouty, and meat is almost totally cut off. On the contrary, a full meat diet seems especially helpful. They should

be given nourishment between meals and at bedtime, and every effort made to improve their general condition. With this, of course, local derangements are to be carefully treated. Carious teeth and pyorrhea alveolaris should receive attention. Any stomach or bowel disorder should be remedied, and every endeavor made to keep the patient under the most favorable conditions. General massage is usually helpful. Concerning the various forms of bathing no general rule can be laid down. In England there can be little doubt of the benefit of such waters as at Bath. In this country, while some patients are doubtless helped by the bathing, many others are made distinctly worse. That this is due to too prolonged hot bathing to the point of depression may be possible, but our cases rather suggest that great caution should be exercised in advising, at any rate, any severe course of baths.

The local treatment of the joints is very important. First comes massage, which in the beginning ought to be given by an assistant. But as a general rule later on the patient should be encouraged, as far as possible, to rub himself. There is usually the double benefit to the joint rubbed and to the hand employed. The hot-air treatment is especially useful in many of these cases. The oven may usually be heated to 350° F. with perfect comfort to the patient, the importance of short applications being always kept in mind. Probably the majority of cases are helped most by periods of only twenty to thirty minutes in the hot-air bath, and periods of an hour and an hour and a half are undoubtedly, in many cases, positively harmful.

The question often arises as to the amount of use that should be made of the affected joints. Leaving out the acute attacks, as a general rule, the more the joints are used the better. The mistake is often very serious when the patient is put to bed and any attempt at using the joints discouraged. The benefit of use is well shown by the temporomaxillary joint, which, although frequently involved, relatively rarely shows permanent damage. These measures may result in great improvement, even in a far advanced case, as, for example, in the case of a woman who for eighteen months had been bedridden, had been unable to feed herself, and who had some teeth pulled in order to be fed. After three months of treatment she was able to talk moderately well, could dress and feed herself, and open the mouth fairly well. Such cases are, of course, not common, but they serve to show that the outlook is not always without hope. There are two things necessary, probably both in the physician and in the patient. These are perseverance and patience. There are probably few cases, even of advanced disease, that cannot at any rate be helped by persistent, patient, systematic treatment.

THE TREATMENT OF DIABETES MELLITUS.

WILLIAMSON, writing in the *Lancet* of January 23, 1904, thinks that while it must be admitted that we have no specific remedy for diabetes, several drugs have a distinctly beneficial action. The author has demonstrated clearly that two drugs at least—salicylate of sodium and aspirin, given separately or combined—have a definite action in diminishing the sugar excretion in certain cases of diabetes of the milder forms. These conclusions are based on many observations made on cases of diabetes in the wards of the Ancoats Hospital. The patients have first been kept for ten or fourteen days or longer on ordinary hospital diet, or on a diet similar to that which they were taking before admission to the hospital. During this period no drug has been given except a few minims of peppermint water, and the sugar excretion has been determined daily. It has thus been possible to estimate the constant sugar excretion apart from drug treatment. Then for a period of two or three weeks or longer salicylate of sodium or aspirin has been given. The sugar excretion has diminished. The drug has been then discontinued and peppermint water given (the diet being kept unaltered). The sugar excretion has increased. Similar observations have been repeated on the same patient, sometimes on many occasions, with the result that whilst the salicylate of sodium or aspirin was being taken the sugar excretion has diminished. The writer published records of such cases in 1901 and 1902. Since these

dates he has had similar favorable results in other cases of the mild forms of diabetes in hospital and private practice. The diminution of the sugar excretion has not been due to the occurrence of any complications, and the patient has felt quite well whilst taking the drugs.

Neither sodium salicylate nor aspirin is a specific for diabetes. The writer states he has never found any definite diminution of the sugar excretion under the action of these drugs in the most severe forms of the disease; also in some of the milder forms they have not had any marked effect; but in other cases of the milder forms he believes he has obtained conclusive evidence of their beneficial action. As regards the mode of administration, he has usually given sodium salicylate in peppermint water, commencing with ten grains three times a day and increasing up to 15 grains, three, four, or sometimes five times a day if necessary. With large doses it is important to watch for toxic symptoms, and to discontinue the drug if these occur. Pure natural sodium salicylate is the better preparation. Aspirin is best given as a powder—ten grains twice a day, rapidly increasing the dose up to 15 grains four or even five times a day. It is best to order the aspirin powder to be taken in a little water to which a drop of lemon juice has been added. Soda water or alkalies should not be taken just after the aspirin powder, otherwise the drug would be liable to decompose in the stomach and cause gastric symptoms. Some patients take the sodium salicylate better than aspirin; others take aspirin better. The latter drug is less liable to cause toxic symptoms in large doses. Sometimes cases are met with in which one of these drugs can be taken but not the other. Recently the author has combined the two drugs with good results, giving sodium salicylate up to 15 grains three or four times a day, and one powder of aspirin, 15 grains, at night. Whenever the two drugs are given it is important to commence with small doses and steadily to increase the quantity, watching for bad effects.

By a restricted diet, by the use of casoid or protene bread, sugar-free milk, etc., along with the administration of salicylates or aspirin, often satisfactory results can be obtained in the milder forms of diabetes. The salicylates and aspirin are of service especially, because they often enable satisfactory results to be obtained without the employment of an absolutely rigid diet. Cases are, however, sometimes met with in which salicylate and aspirin cannot be taken owing to the disagreeable symptoms that they produce even in small doses.

Many other drugs have been used in the treatment of diabetes, and it is probable that opium, morphine, codeine, sumbul, uranium nitrate, arsenic, and antipyrin have in certain cases some beneficial effect. An objection to the first three drugs is their constipating action, and this is especially undesirable in the most severe forms of the disease, since constipation appears to predispose to the onset of coma. It is important, therefore, when these drugs are given that care should be taken to keep the bowels regular. In the most severe forms of diabetes, in which the urine gives a deep brownish-red coloration with perchloride of iron, the author believes the alkaline treatment, bicarbonate of sodium in large doses, is of some service in postponing the onset of coma. The dose should be steadily increased up to two, three, or four drachms or more daily. The bicarbonate is best taken in frequent doses in soda water or milk. It is very important not to produce gastric disturbances by the sodium bicarbonate, but it is remarkable how well these large doses are usually taken by diabetic patients.

THE USE OF ANTISTREPTOCOCCIC SERUM IN THE TREATMENT OF SCARLET FEVER AND DIPHTHERIA.

MACKIE in the *Lancet* of February 20, 1904, gives the following conclusions in regard to this subject, which is particularly interesting, in view of the fact that this serum can now be obtained in this country:

1. Antistreptococcic serum is of distinct value in a certain number of cases of scarlet fever, particularly in those where the throat lesion is severe and toxemia is going on.

2. Bacteriological examination will give no sure guide as to the cases in which

serum will be beneficial, therefore it is advisable to give the serum early and to make the bacteriological examination afterward.

3. The serum ought to be given early in the disease just as in diphtheria. The longer the disease has lasted before the serum is used the less likelihood is there that it will be beneficial. Antistreptococcic serum is too often brought in with the strychnine and oxygen, when it is unreasonable to expect it to do good.

4. If the first dose or two have no effect on the temperature, its continuation will probably not be of any value.

5. The serum is liable to produce urticario-erythematous rashes.

6. Even in those cases in which it does no good there is no evidence to show that it does harm.

THE NATURE AND MEDICAL TREATMENT OF SPASMODIC ASTHMA.

WILKINSON, in an article with this title in the *Medical Chronicle* for January, 1904, states that where asthma shows itself by repeated morning sneezing—the author does not refer to "hay asthma"—he believes arsenic rarely fails.

In ordinary asthma he commences with three minims and rises to five minims of Fowler's solution, given three times a day after food, and continues the treatment, with occasional intermission, for several months. Patients vary very much in the powers of taking arsenic without ill effect, but so far, by accommodating the dose to their capabilities, they have rarely failed to secure a prolonged trial. By far the commonest toxic symptom is gastrointestinal irritation. In some such cases a carbonate of bismuth mixture taken before the meal will prepare the way for the arsenic after the meal. This plan he has adopted with success in several cases of chorea, where the difficulty more frequently arises on account of the larger dose required. Whether arsenic in the form of mineral water is more effective than as usually administered is still in doubt. It is a point worth investigating.

The efficiency of arsenic in producing pathological lesions in the late beer epidemic—and in his somewhat extensive experience nerve and skin phenomena were quite out of proportion to gastrointestinal symptoms—he is strongly disposed to think was due, not merely to the quantity of the drug, but to the form in which it was taken. He believes that free dilution markedly accentuates and considerably modifies the action of some drugs, amongst which he places arsenic and potassium iodide. By the long-continued use of arsenic he has noted the habit of migraine and asthma cured in the same individual—a case in which there was not the slightest family or personal tendency toward the "uric acid diathesis." This action of arsenic in asthma is not surprising, as its use by the Styrian peasants to improve "the wind" is well known. Moreover, if the nerve fibers distributed in the epithelial surfaces of the nose or bronchial tubes be at fault we do not wonder that the drug most effective in touching the nerve-endings and epithelia of the skin and bladder, etc., should thus alter the asthmatic receptive areas. Its chemical congeners, phosphorus and antimony, the author has not yet systematically tried. He believes, however, that the latter drug deserves more consideration than we usually give to it. Its disuse in large doses as an emetic and depressant has unduly detracted from its value in small doses as an alterative and febrifuge.

Undoubtedly we must place alongside arsenic as a preventive in asthma iodide of potassium. It may succeed where arsenic altogether fails. For continuous administration he rarely gives more than five grains three times a day, combined with aromatic spirit of ammonia, and, if need be, a vegetable bitter. The impression he has received is that potassium iodide neutralizes the tendency to the attacks rather than removes the peculiar nervous basis of the disease. Its influence therefore is often immediate, and the intermission of the remedy is more likely to be followed by quick relapse of the disease than with arsenic. The author has at present a case in point in the outpatient department at the Manchester Royal Infirmary. A young man, twenty-six years of age, for two months had a short but very severe paroxysm of asthma each night, the dyspnea being most intense from 2 to 2.30 A.M. The iodide mixture stopped the attacks at

once, and for the next eight weeks he had only one slight paroxysm, and was able to follow his employment. The slight relapse was produced by a dietetic indiscretion. Thinking himself cured, he omitted the medicine for one week and the attack returned, but again yielded at once to the treatment. This salt may be administered without harm for a long time and without intermission, as it is so easily excreted. The last dose should always be taken at bedtime, and when it is desirable to diminish the amount of the drug the dose taken earlier in the day should be the one omitted. Iodide of potassium given as above is by far the best remedy for the secondary asthmatic spasm which adds to the nocturnal difficulties in chronic bronchitis. This element is present by night more commonly than is generally realized.

The author has not been able to satisfy himself that hydriodic acid is in any way superior to the potassium salt. One medical friend of his, after a personal trial, returned to potassium iodide; another fancied that the acid gave him more relief. In the author's experience no other drugs compare with arsenic and the iodides as preventives. Belladonna and quinine he places next on the list. Quinine, mentioned by Dr. Hyde Salter, is used by the Americans, the author states, who appear to treat the patient's "constitution" quite as much as his "disease." Where a gouty tendency is present the author would, of course, adopt measures for dealing with the excess of uric acid, but he is not one of those who hold that uric acid plays so important a rôle in medicine as some would have us believe. He says this, of course, with full appreciation of the good work which has been done in this special department.

THE NECESSITY OF A RELIABLE SIGN OF COMPLETE ANESTHESIA.

WHITE expresses the belief that we need a sign of this character, but is not able to find one. He asks, in the *New York Medical Journal* of February 27, 1904, if there is any one sign by which the anesthetist can tell in every case that the patient is thoroughly under and relaxed before an incision is made. His experience leads him to say there are no positive signs in all cases by which we can be guided, though general rules apply to many. The loss of the corneal reflex has been used for years as an indication of the anesthetic state, and it is depended on to this day by a great many men. The writer characterizes the practice as unscientific and useless, and the application of this test a score of times during a single operation is positively barbarous. In children, especially, it is unreliable. We now hear little of the "Simpson snore," but that was said to be a good guide. The condition of the pupils is probably most to be depended upon, but any anesthetist of wide experience will not place implicit confidence in the movements of the iris. The classical signs are large pupils, reacting to light, partial anesthesia; small pupils, contracting slightly or not at all to light, moderate to deep anesthesia; and wide pupils not reacting, profound and dangerous anesthesia. We may say that the pupils, as an index, stand in the same relation to anesthesia as the pulse does to fever. While in the majority of cases an accelerated pulse does indicate fever, how many physicians are willing to dispense with their thermometers? The pupils may be a valuable asset in nine out of ten cases, but that is far from perfection.

The writer believes that his experience is not exceptional, but the pupils in so many cases have been misleading that we need a sign more constant. In several cases in the last six months, the anesthetic given slowly, never were contracted pupils produced, notwithstanding that the patient was undoubtedly under the influence of chloroform; and in another instance, in order to keep the patient relaxed, the iris was scarcely visible and did not react to light, while the pulse remained good, and no especial evidence of shock was reported subsequently. In many cases the writer has announced, after carefully noting small pupils, that the patient was ready for operation, and has been quite crestfallen on hearing mutterings as soon as the incision was made. In circumcision cases this is not rare. Other anesthetists have had similar experiences, and the author cites an instance in which a house physician was assaulted by a colored woman who he

thought was "under." Simply because the patellar reflex is lacking or the jaw clonus is present we cannot say that a pathological condition exists. The rule holds good with the action of the pupil. Occasionally the pupils are irregular, and in another instance adhesions may be an obstacle to the free action of the muscle, and in highly nervous or sensitive individuals the iris may be most capricious. All in all, this is a guide that is far from infallible, and entirely too much confidence is placed in it.

A sign which has appeared more constant is the stretching of the sphincter ani; the patient if deeply anesthetized remains perfectly quiet and breathes naturally during this test; but for obvious reasons this test is not applicable in all cases.

Anesthetists need a sign upon which they may place the utmost reliance, and presence of which may justify them in saying fearlessly to the surgeon, "He is ready." It would prove a boon to the surgeon, the patient, and anesthetist, and it remains for intelligent observation to detect one.

THE TREATMENT OF SYPHILITIC AND ANEMIC HEADACHE.

The *Glasgow Medical Journal* for January, 1904, contains an article by HINSHELWOOD on headache. In its course he tells us that amongst the toxemic headaches we also class the syphilitic headaches. In all cases of chronic headache this is a possible cause which should never be lost sight of. More especially should we suspect syphilis if the headache has distinctly nocturnal exacerbations. Syphilitic headaches are often of a most persistent and chronic character, and may have existed for a very long time before their true character is suspected. This headache may be due to a variety of causes—periostitis of the cranium, meningitis, or intracranial gummata. All give rise to headaches, sometimes of a dull and sometimes of a very acute character, but most syphilitic headaches are worse at night, and this should always rouse our suspicion as to their true character.

The writer has seen many cases of headaches where the patients were sent to him with the idea that eye-strain was the cause, but where the distinctly nocturnal character of the headache directed his attention to the real cause, as was subsequently proved by their rapid disappearance under treatment. The physician is often misled by the absence of syphilitic history or syphilitic traces on the body of the patient. But syphilis is such a variable disease that the experienced observer attaches no importance whatever to the absence of syphilitic history, and this even when he is quite certain that the patient is telling him the truth. The primary lesion and usual secondary symptoms may have been so slight and trifling as to have escaped altogether the notice of the patient, and yet he may suffer from later syphilitic manifestations in a most severe form. This cannot be too strongly insisted upon, that the absence of syphilitic history is of comparatively little moment in diagnosis. Should a patient suffer from chronic headache with distinctly nocturnal exacerbations, and for which no cause can be discovered, it is a very safe rule to put him on a short course of specific treatment. The author's usual prescription is 1-12 grain hydrarg. bichloride and 20 grains of potassium iodide thrice daily. If the headache be of syphilitic origin it will very soon be influenced by this treatment. There is nothing more striking than the rapid relief often given by this means to obstinate headaches, from which the patient has been suffering for a long time without their true character being suspected.

In order to perform its functions properly and without discomfort, the brain must not only be supplied with pure blood, but it must be sufficient in quantity as well as in quality. The brain has a very large vascular supply, and it has been estimated that it receives fully one-fifth of the blood in the human body, a fact which vividly bears witness to its immense and never-ceasing activity. If its functions are to be properly carried on it is absolutely essential that it should be freely supplied with the blood of proper quality.

Hence, in the various forms of anemia, where the blood-supply to the brain is defective both in quantity and quality, headache, generally frontal or vertical, is a very frequent symptom. These anemic

headaches are often relieved by the recumbent posture, which insures a more abundant supply to the brain. Remedies such as phenacetine and antipyrin may give temporary relief, but cure of the headache will only be produced by the cure of the anemia, and sending a sufficient stream of rich blood to the brain. This anemic headache occurs both in the ordinary form of anemia, in which there is chiefly a deficiency of hemoglobin (as in chlorosis), and also in cases where the anemia is due to loss of blood. The pain is generally frontal or general, and in chlorosis it is often complained of as being peculiarly intense at the back of the eyes, the patient often describing the sensation as if the eyes were being dragged back into the head. Frequently patients have consulted the writer with the firm belief that this pain was due to eye-strain, and it was very difficult to convince them that it was due to the impoverished condition of the blood.

TREATMENT OF GALL-STONES.

HALE WHITE gives the following views in the *Clinical Journal* of February 10, 1904. He thinks that in every case of gall-stones the first thing to be decided is whether or not to ask a surgeon to operate. Operation is imperative when jaundice with repeated rigors and attacks of pyrexia render infective cholangitis likely, for such a condition may easily become suppurative or lead to portal pyemia; but the author had a patient whom he and a well known surgeon decided was too ill for operation, and she recovered completely without operation. Doubtless the stone ulcerated in the duodenum. Operation, too, is imperative if there is suppuration round a stone. But in the great majority of cases the indication for operation is not imperative, and much thought has to be applied to each case. The following points must be borne in mind:

Operations for gall-stones may be very difficult, and they should not be undertaken by any other than skilful surgeons. In the next place there is no doubt that people whose bile-passages are constantly being irritated by gall-stones are more liable to hepatic carcinoma than others, but although this extra liability is a point in favor of operation it is by no means so great as to compel operation in every case. Lastly, the social position of the sufferer makes much difference. If he is a member of the working classes and frequent attacks of biliary colic mean a loss of money, on this ground alone operation may be necessary. Gall-stones in the gall-bladder frequently produce local peritonitis around the gall-bladder, and that may lead to much pain from the formation of adhesions, which may even constrict the duodenum and lead to gastric dilatation. We must remember that the tendency to the formation of gall-stones ceases as people grow older; it is rare to find them active in people over seventy.

There is no doubt that medical art can do much to relieve the sufferers from gall-stones, quite apart from operation. In the first place, morphine and a hot bath will relieve the immediate pain. But we must do more than this; we must try to prevent its recurrence. There is no doubt that tight lacing must be given up, for it displaces the liver downward, and in such a way as to hamper the gall-bladder so that the flow of bile is impeded; further, such tight lacing impairs the respiratory movements, which probably greatly aid the flow of bile. Gentle, systematic exercise is useful, for it not only helps the general health, but increases respiratory movement. Horseback exercise has an especial reputation for these cases. The most divergent views have been expressed as to the influence of diet, but we do not yet know any article of food that encourages the production of gall-stones, and all that is necessary is that food should be small in quantity and easily digestible. All experience indicates that it is very desirable to keep the bowels open, and that this is best done with salines. These are commonly given as a draught of any of the sodium and magnesium sulphate natural mineral waters. There is no doubt that patients who are liable to attacks of gall-stone colic are very much benefited by periodic visits to Carlsbad and Marienbad, both of which have natural saline aperient waters. The patients are made to drink the waters and are put upon a restricted diet.

But often for some reason or another patients cannot go to Carlsbad or any similar place, and then the best thing is to

make them take large quantities of olive oil. Gall-stones are to some extent soluble in olive oil at the temperature of the body, and it is believed that oleic acid is absorbed and excreted by the bile. Be this as it may, many cases have been benefited by olive oil. No one pretends that it will cure all cases. How can we hope that it will benefit the common case in which a dilated gall-bladder is stuffed with fifty or one hundred gall-stones so tightly packed as to form almost a solid mass? The oil can do no harm; it can be stopped at any moment; and if immediate operation is not decided upon it should be given a trial. It is a good thing for the patient to take as much olive oil a day as he can, but he need not take more than half a pint a day. It should be taken with meals. The simplest plan is to drink it out of a wine-glass, and some patients can do this. Many, however, are nauseated, and then the oil may be taken with salad or mashed up with potatoes or fish. If it produces nausea however taken, oleate of sodium, sold under the name eunatrol, may be given; about thirty grains a day should be taken, and it is best given as a pill. Usually when these large amounts of olive oil are taken an aperient is not necessary, but if there is the slightest tendency to constipation a saline mineral water should be given on rising in the morning.

ANTIPYRIN AND PURPURA.

The *British Medical Journal* of February 6, 1904, quotes from the *Comptes Rendus de la Soc. d'Obstetrique de Gynecol. et de Péd.*, October, 1903, a case of much interest, namely, an instance of sudden death during pregnancy when the patient had taken a large dose of antipyrin and had a purpuric rash. Unfortunately the patient's decease occurred quite unexpectedly within a few hours after her admission into a hospital, so that the blood was not examined. She was a needlewoman, aged twenty-two, in the sixth month of her first pregnancy. Six days before admission she had had a bad chill and lumbar pains after getting her feet wet. On the next day the midwife prescribed four cachets of antipyrin, which the patient, through a misunderstanding, swallowed all at once. She took six more at intervals on the third day. As little urine passed triticum repens was prescribed. On the fourth day a doctor was called in; he found the patient suffering from intense sacral pains, and gave salophen and Dover's powder. On the morning of the fifth day the patient seemed better, lactophenine and exalgine were prescribed, with plenty of milk; but in the evening she was much worse, an ecchymosis was noted in the right conjunctiva, and there was slight delirium.

On the sixth day, as the patient was very ill, she was admitted into the Hospital Beaujon at 10 P.M. She was in full possession of her faculties. The body was covered with a rash such as is seen in certain subjects after a strong dose of antipyrin. Subconjunctival hemorrhages, bright-red and elevated, were noted in both eyes on the inner side of the cornea. The abdomen and back, as well as the thorax below the mammæ, were covered with purpuric spots of different sizes. The tongue and teeth were black, the gums injected, the pulse 120, the temperature 99°. The pregnancy seemed to be progressing normally. A careful examination of the blood was to be made on the following morning, but the patient, after free dry-cupping to relieve the anuria, which was complete, died suddenly at 3 A.M. Both layers of the pericardium, the peritoneum, and the mucous membrane of the stomach and upper part of the duodenum showed abundant ecchymoses. The uterus, fetus, and placenta were quite normal and free from bleeding points, though there was a very large subserous hemorrhage in Douglas's pouch. In the kidneys the hemorrhages were limited to the connective tissue under the capsule.

Rudaux is doubtful about the precise interpretation of the purpura. It was not purpura simplex, as there were marked visceral hemorrhages; not infective purpura hemorrhagica, as there was no fever. Werlhoff's disease, rejected as a special variety by Dieulafoy, is never so severe as was this case, which might have been an instance of Hayem's medicinal or toxic type classed under deuteropathic purpuras. As for the cause, antipyrin poisoning seemed very likely, as there was a characteristic rash, and hemorrhages have been observed in undoubted cases. Auto-

infection of pregnancy suggested itself, as the pains preceded the administration of the drug. Rudaux puts forward a hypothesis that the heavy dose of antipyrin produced toxic effects in a woman whose liver acted badly owing to the biliary stasis due to pregnancy.

The case is of much importance to the toxicologist; many women take quantities of antipyrin without medical advice, whilst the causes of sudden death during pregnancy are often subtle and may lead to judicial inquiries.

MANAGEMENT OF RHEUMATISM IN CHILDHOOD.

Writing in the *Medical Record* of January 9, 1904, WINTERS states that for the control of active rheumatic manifestations there are two leading and chief factors—the state of the digestive organs and the diet.

With a coated tongue he gives calomel, followed by rhubarb and soda; the latter to be persisted in as long as the tongue is furred. The dose of the rhubarb is proportionate to its effect on the bowels; soda should be in twenty-grain doses three times a day, before nourishment.

Milk should be the sole food as long as evident symptoms remain.

The proteid of milk contains no nuclein, and yields no uric acid. The urine becomes uric-acid-free on milk diet. Milk contains an abundance of phosphate of potash—muscle-salt. Citric acid, a valuable antirheumatic, is present in considerable amount.

The first extension of the diet should be the addition of a strained cereal to milk.

Mention of cereal within hearing of the patient is unfortunate and injudicious. The rheumatic child invariably has an abhorrence of cereals. This constitutional loathing of the child's natural food is traceable to faulty feeding. Savory broths, soups, beef juice, excess of meat, etc., create a repugnance to the vitally indispensable cereals and vegetables. Animal broths are totally destitute of food properties. This is ancient, recent, and unalterable physiology. Nevertheless, physicians wittingly and knowingly recommend them for children, where the first requisite of all food is its building or tissue-forming value. There is a vast amount of obscure ill health in children from heedless use of these foodless preparations.

When animal food is to be added to the diet it should be in the form of meat, not broths or beef juice. The contained extractive of broths and beef juice, by overstimulating metabolism, aggravates rheumatic anemia and every rheumatic tendency.

Cereals must be eaten without sugar.

Sweets and animal broths in children, and alcohol and sweets in adults, are the bane of the rheumatic patient, and constantly discredit the physician by thwarting all treatment.

Vegetable soups—pea, asparagus, celery, potato, bean, tomato—are nutritive and appetizing.

When all active rheumatic manifestations have been dispelled, animal broths or cereals are adjuncts by stimulating appetite. They are not given for any food value, but as appetizers.

Having secured a clean tongue, all phases of rheumatism vanish with milk as the only food for a proper period; then in due succession, strained cereals, vegetable soups, cereal as a vegetable with butter and salt, baked potato, bread, green vegetables, fruit.

Failure in dietetic management in the past is attributable to excessive use of broths and other animal food; sugar and sweet desserts; the use of alcohol; withdrawal of fruits and cereals.

THE PREVENTION AND TREATMENT OF PUERPERAL INFECTION.

NORRIS gives the following directions in *American Medicine* of February 13, 1904:

Having made an early diagnosis of infection, the infected area, which is usually within the uterus, should be explored by the finger to determine further, if possible, whether we have to deal with putrid absorption from decomposing débris or the smooth endometrium of septic infection. If our cases always presented the striking contrast and the entire uterine cavity could be easily palpated, as described by some authors, it would at once settle the question of curetting the uterus. While it is true that the endome-

trium is often smooth and the uterus empty in septic endometritis, and the microörganisms have penetrated the tissues beyond the reach of douche or curette, in very many cases—indeed, in the majority—such can only be determined by examination under ether (even then with great difficulty), for in most cases there will be found at the placental site and elsewhere roughened areas which will often leave one in doubt. The reaction that has appeared against the curette is certainly beneficial, since we have learned that every patient with child-bed sepsis cannot thus be cured, and that many are really made worse. The dangers of perforating the womb, of carrying infection into the uterus through ignorant and faulty technique, of opening new avenues for absorption of toxic agents already present in the uterine or vaginal canal, of destroying the lymph barriers erected by nature to cut off lymphatic or circulatory absorption—all these real dangers should not deter us from utilizing a valuable means of treatment at the right time and in the right manner in the right cases.

The appropriate cases are those in which the uterus contains débris, often so closely adherent to the uterine wall that it is almost impossible to understand how such removal can be efficient with the finger, as is insisted upon by some able writers. The finger should try to locate the areas to be curetted, and in the author's experience the best results have followed the use of a sharp curette. Where the endometrium is smooth, of course there is no need for scraping. The case has yet to be seen of puerperal endometritis after labor at term that shows the continuously smooth uterine cavity sometimes described by those who have no use whatever for the curette in puerperal sepsis. The danger of destroying nature's lymph barriers has been overestimated. This protecting zone is present especially in sapremia, the very class of cases to which the curette is applicable and in which it can do the least harm. The curette should be used by the skilled and experienced hand. In these cases curettage is not a minor operation, and demands far greater surgical skill than the formal plastic operations of the gynecologist. The third condition for its successful use is that it should be used at the earliest possible moment after the diagnosis of infection has been made and after exploring the uterine cavity with the finger as thoroughly as possible.

Following curettage, the question of the douche is also under discussion at the present time. For putrid endometritis a disinfecting douche is indicated. The patient must not be poisoned, and strong antiseptics that aim to destroy virulent microörganisms, which, as a matter of fact, in the septic variety, have passed into the tissues beyond the reach of the douche, are not only useless, but dangerous. Weak solutions of lysol (one per cent) or creolin (two per cent) are sufficient to combat putrefaction, and can be used with safety. A gauze drain is then inserted to the fundus and removed in twenty-four hours. When, as rarely happens, we find the uterus empty, neither curette nor douche is indicated. When indicated, the operation to achieve the best results must be done early and thoroughly, and should almost never be repeated. Repeated douching will be required very rarely, and only when an offensive discharge persists.

A SIMPLE AND PRACTICAL METHOD OF DESTROYING SNAKE VENOM IN THE BITTEN PART.

ROGERS gives the following directions in the *Lancet* for February, 1904, for a practical method of treating any kind of snake poisoning which promises to be of great value in all cases seen early, and which might be carried out by any intelligent person if a medical man was not at hand. He has shown that Calmette's serum is not strong enough to prove efficient against full doses of colubrine venoms, while it is very seldom at hand when wanted, and tends to lose its power in a hot climate. It is also useless for viper bites, while the methods of counteracting the physiological effects on the circulation of the latter would not be likely to succeed when very full doses have been injected. If, however, most of the poison could be destroyed locally at the seat of its injection before much of it had gained access to the circulation, then the above methods might prove efficient in dealing

with the comparatively small amount of venom already in the system. Many attempts have been made to find some substance which would destroy the poison at the seat of injection, the best known of which is permanganate of potassium, which Wynter Blyth first showed will rapidly destroy the power of cobra venom when mixed with it *in vitro*. But experiments by Brunton and Fayrer and others, in which strong solutions of this substance were injected at the seat of insertion of the poison, did not prove successful in averting the death of the animals. They have, however, recently suggested a more radical plan of using the salt—namely, first to place a ligature round the limb above the seat of inoculation of the venom, and then to make a small incision through the place of injection and to rub in pure crystals of the permanganate moistened with a little fluid, with a view to neutralize as much as possible of the venom before it has had time to be absorbed into the circulation. The author carried out a preliminary series of experiments to test this method of using the salt, with very promising results.

In the first place he set to work to find out if the permanganate will destroy other venoms than that of the cobra by mixing from ten to twenty lethal doses with a fraction of a cubic centimeter of a 10-per-cent solution of permanganate of potassium—enhydrina, bungarus fasciatus, rattlesnake, African puff-adder, and daboia venoms being tried. The mixtures were injected into animals after from five to ten minutes, with the result that none of them showed any symptoms of poisoning except one, which had received a very large dose of bungarus fasciatus venom mixed with less than its weight of the permanganate, and in this case the animal lived longer than a control with less than one-third of the dose, so that most of the venom had been destroyed locally in this instance. It is clear, then, that the salt will destroy *in vitro* nearly its own weight of every class of snake venom. Next, rabbits and cats were chloroformed and injected with several times a fatal dose of cobra or daboia venom, a ligature was applied after half a minute, five, or ten minutes, and the treatment described was carried out, the ligature being released immediately after its completion. In the case of the rabbits only very marked prolongation of life, as compared with the controls with the same doses, was obtained, owing to these animals being found to be much more susceptible to the venoms than cats, so that the doses injected into the rabbits were many times a lethal quantity.

In the case of the cats much more favorable results were obtained, only two out of twelve animals treated having died, one being the first case treated with cobra venom, while the other had received five times a fatal dose of daboia venom (a much larger dose than this snake could inject in the case of an adult man), and the ligature was not applied until after five minutes. On the other hand, recovery took place after ten lethal doses of cobra venom treated after half a minute, from five lethal doses after five minutes, and from three lethal doses after ten minutes; while with the daboia venom animals were saved from five lethal doses after half a minute, and from three lethal doses after five and ten minutes, respectively. He also found that even thirty seconds after the injection of the venoms there was a local extravasation of blood-stained serum present which clearly indicated the position of the poison, and the salt was rubbed in directly over this until the tissues were quite blackened. The amount of tissue thus destroyed was quite superficial, while the salt has antiseptic properties.

The author has in prospect an opportunity of carrying out further experiments on his return to India very shortly with fresh venoms, and to wait longer before ligaturing the limb, so as to ascertain the exact limits of the value of this method. The rapid local effusion just mentioned leads the writer to the belief that after the first few seconds this pouring out of lymph will very materially retard the rapidity of the absorption of the venoms, so that it is possible that even half an hour or more from the time of the bite a considerable proportion of the venom may still be unabsorbed at the site of its injection and so may still be destroyed by the treatment suggested; and it is obvious that if this can be done at any time before a fatal dose has entered the circulation life will be saved, and in any case the chances of

success with the other methods of treatment will be greatly enhanced.

That the absorption of a subcutaneous injection of snake venoms is very slowly completed is shown by the fact that one milligramme per kilogramme of cobra venom in a cat will kill in a few minutes when injected intravenously, yet the same dose takes from twenty-four to forty-eight hours to cause death when injected subcutaneously. When a very large dose, such as fifty times a lethal amount, is injected subcutaneously into a dog's tail and this member is cut off inside the seat of injection within a few seconds, the animal will still die, as shown by Fayrer years ago. The reason is that one fatal dose may be absorbed out of such a large quantity within a few seconds. In the case of man, however, such a relatively large dose can never be received, so that there is much longer time for action—how long can only be determined by further experiments on animals. Nevertheless, the results given us by the author he believes sufficient to warrant the use of his method in practice, especially as it is efficient against all kinds of snake venoms.

At the suggestion of Sir Lauder Brunton an instrument has been made consisting of a lancet covered with a sheath, in a small space at the base of which permanganate crystals are kept, the whole being but one and a half inches in length, so that it can easily be carried in a corner of the waistcoat pocket always ready for instant use. This will shortly be sold at a very low figure, so as to bring it within the reach of even the poorest classes in India and elsewhere.

APPARENT DEATH OF THE NEW-BORN.

ZANGEMEISTER (*Centralblatt für Gynäkologie*, Sept. 26, 1903) reports excellent results from the administration of oxygen through a catheter introduced into the larynx in cases of apparent death of the new-born. Oxygen is conducted from its containing cylinder into the rubber reservoir which is attached to the tracheal catheter. The lungs are filled by gentle pressure on the rubber reservoir, and then emptied by pressure on the chest. The tracheal catheter should be sufficiently small to permit of the escape of air between it and the tracheal walls. All the manipulations can be performed while the child is in a hot bath. By this method the author has never observed the development of pulmonary emphysema such as sometimes occurs after artificial respiration by mouth-to-mouth insufflation.

THE SPLINT TREATMENT OF SCIATICA.

CLARKE (quoted in the *Medical Record*, Oct. 21, 1903) extols the virtues of the Weir Mitchell plan of immobilization of the limb by a long splint. He has employed this device in twelve cases. Eleven were men, their average age being forty-nine years. The average duration before coming under observation was nearly six months. The average duration of treatment was five and one-half weeks. Ten cases were cured. One had a severe relapse some weeks later, but was cured by a second course of treatment. One was not relieved, but he was a restless patient and would not keep the splint on. The restraint is very irksome, and a hypodermic of morphine is often required the first night or two. The splint must be watched carefully, and readjustment may be necessary, especially if pain appears in the foot, over the outer malleolus, or in the ankle.

BRAIN TUMOR—METHOD OF RELIEVING PAIN.

BROWNING (quoted in the *Journal of the American Medical Association*, Nov. 21, 1903) claims that relief of pain in cases of brain tumor can be secured by relieving intracranial blood-pressure by the administration of such depressants as aconitia, veratrum, or gelsemium, in doses sufficient to control the pulse. They cannot in every case and at all times stop pain, but they relieve it even though the condition has existed for many months. The classes of cases that they are likely to relieve are those where there is more or less general increase of the intracranial pressure, which occurs most typically in interstitial growths. The pain is less intense, and more continuous. They may be still more useful in cases where there is paroxysmal augmentation of the arterial pressure with terrific pain seizures. Where the pain is the result of the direct

implication or stretching of the external structures, as the meninges and outgoing nerves, there is neuralgia and localized pain, and the good to be derived from depressants may be only proportionate to the amount in which the pressure is the factor. The tendency to brain hemorrhage which exists in some of these cases is favorably influenced. In cancer cases the use of depressants may have a diagnostic value.

ADRENALIN IN THE TREATMENT OF SURGICAL SHOCK.

MARTIN and PENNINGTON (*American Medicine,* Nov. 21, 1903) report six cases in which adrenalin chloride was used to combat symptoms of impending death. In two of the cases the effect of the adrenalin was immediate and unmistakable. In both it seemed life-saving, but the clinical evidences presented by the writers as to its effect must be regarded as inconclusive on all points. It was not employed on a single case in which there was a fair prospect of the preservation of life without its use; hence the unbroken mortality in the six cases cannot be counted against it.

One case of typhoid perforation apparently speaks strongly in its favor, since the authors have never seen a patient so entirely and profoundly collapsed make an operative recovery. This one case, however, must be corroborated by many others before confidence can be placed in the drug.

Laboratory experiments apparently show that adrenalin, by intravenous injection, is the most powerful cardiac and vasomotor stimulant ever presented to the profession. Its value is still further enhanced by the fact that it stimulates the respiratory center and increases general metabolism and body temperature.

The toxic dose for man is not known, but it is probably several hundred times greater than that in which the drug is ordinarily given. Because of the rapidity with which it undergoes alteration in the body it is inert so far as its systemic effect is concerned, when given either by the mouth or by the rectum. Because of the tendency to abscess formation at the seat of injection, incident to the ischemia caused by strong solution, the dilution should be at least 1:10,000 when the drug is given hypoderimcally. It does not seem probable that any effect can be expected when thus administered from less than 2 cubic centimeters of the 1:1000 solution. Apparently it is safe to give an initial dose of 10 cubic centimeters of the strong solution in 90 cubic centimeters of normal salt.

In cases of urgency, adrenalin chloride should be given intravenously, in a dilution of 1:10,000. The injection should be slow, thus prolonging the effect, and should be pushed up to 100 cubic centimeters of the strong solution, or until the heart clearly and unmistakably responds to its influence.

There is yet no convincing clinical proof to the effect that the drug is as efficacious when used on man as laboratory experiments would indicate. Because of its power of lessening the bacteriolytic power of the blood of animals, its use in cases of infection in the human should be practiced with great caution, until a wider experience has proved its safety or danger in these cases.

SUTURES—THE VALUE OF THE BURIED ANIMAL SUTURE IN ASEPTIC SURGERY.

With the emphasis of earnest conviction, MARCY (*Maritime Medical News,* November, 1903) recommends that every surgeon become thoroughly familiar with methods of wound closure with buried absorbable sutures. The material for such sutures is preferably tendon.

All aseptic wounds closed with buried aseptic tendon sutures will remain aseptic, and in well vitalized structures will be followed by primary union. Thus there is obviated all danger of subsequent infection, expensive and troublesome dressings, all necessity for removing the sutures later, and all cause for a lengthened period of convalescence. As a matter of fact, operations hitherto impossible have been rendered feasible by the use of buried absorbable sutures, such as the reconstruction of the pelvic structures, and the closing of rents in the peritoneum.

Marcy, now in his 500th series of hernia in the male, obtains with this suture material ninety per cent of cures. The reformed structures, he believes, may be greatly strengthened by the rejoining of the sundered tissues with lines of buried

sutures, as contrasted by a single layer of interrupted sutures—for example, the closure of the abdominal wall in laparotomy. Here, in the closure of the wound by a single line of interrupted sutures, about ten per cent of the cases result in hernia at the line of the incision. When closed in layers the compound structures are rejoined, and in primary union hernia should be altogether avoided. In over 1500 laparotomies of this character Marcy has had but a single subsequent hernia.

HERNIA—ONE THOUSAND ABDOMINAL CLOSURES FOR HERNIA.

As it is said that probably about ten per cent of abdominal sections closed by prevailing methods result in subsequent hernias, BALDWIN'S history (*Annals of Surgery,* November, 1903) of one thousand abdominal closures by a new method without a known hernia may prove enlightening.

In closing an ordinary abdominal incision made in the median line, the bellies of both recti muscles are exposed so that they will be brought into direct apposition when the sutures are tightened. The muscular tissue serves as an excellent buffer and keeps the abdominal contents from direct impact against the line of closure of the fascia. Through-and-through silkworm-gut is now introduced from within out, in such a manner that the needle catches merely an edge of the peritoneum. It is then passed well back through the muscle and fascia and out at a suitable distance from the skin margin.

The fascia is next brought together by an over-and-over stitch, using a doubled thread either of coarse silk or cotton. This is introduced into the needle so as to give a loop about two feet long. To the end of this loop is attached the wire, which is sharply bent upon itself, so as to be readily drawn through the tissues, the loop being used merely as a guide for the easier introduction of the wire. The over-and-over stitch is so passed as to take in about a quarter of an inch of the edge of the fascia, and includes no other tissue. It is introduced very loosely, so that each turn can be caught later with the finger. As it reaches the end of the incision it is passed from within out through fat and skin so as to make its exit an inch or more above the end of the incision. By means of this guide thread the wire is introduced loosely so that it lies in the wound as a helix, the end of the wire appearing through the skin as the last of the thread is withdrawn. Care should be taken to see that the fascia, which is thus brought together, has been carefully cleaned of fat. This cleaning is best done when making the primary incision and before incising the fascia. By holding the belly of the knife at a suitable angle the fat is easily separated for one-half inch on each side.

A handled needle with an eye at the point is then introduced through the skin and fat about an inch from the other end of the incision, and brought out just above the fascia so as to engage the other end of the wire, which is then withdrawn. This needle has been previously passed through two pads about an inch square and made of six or eight thicknesses of gauze. Before withdrawing the wire from the needle, one of these gauze pads is slipped down over the wire so as to rest next to the skin. The other end of the wire is then threaded through the needle, and the other gauze pad is placed in position, and a perforated shot placed outside of each pad.

The incision is then carefully dried, if there has been any oozing, and while an assistant draws up the ends of the silkworm-gut, so as to secure apposition of the peritoneum throughout, the wire helix is drawn straight by traction with forceps on each end, care being taken to see that no kinks are formed during this process. The wire should be drawn back and forth once or twice so as to be sure there are no kinks. The perforated shot are now pushed down against the pads and clamped.

The fascia is thus held in absolute contact, and the operator can see that not a bit of fat or muscular tissue intervenes. The silkworm-gut is then tied in the usual way, care being taken that it is not drawn too tight, as this is probably the most common cause of stitch abscesses. The use of the silkworm-gut precludes any possibility of dead spaces; all the tissues are brought into absolute contact, layer to layer.

In cases in which the recti muscles are widely separated no attempt is usually

made to bring them together, but extra care is taken to secure apposition of the fascia.

The line of incision is supported by a snug binder of canton flannel, made in the form of a many-tailed bandage. The bandage is so made that each strip overlaps the one below by about one-half its width, and they are stitched together up and down at the back by two lines of stitches several inches apart, so that there is little tendency for the binder to be thrown into folds.

If the case does well the dressings are removed the tenth day. If a stitch abscess occurs the affected stitch is at once withdrawn, and if it seems best, one or two on each side; but the wire is not disturbed until the usual time. The bandage is worn continuously for three weeks, day and night for one month, except as it is removed for bathing, and during the day for still another month; it is then discarded.

In an abdominal wall enormously thickened from a deposit of fat this method cannot be used, since the pressure of silkworm-gut will be too great.

NEVUS—SURGICAL TREATMENT.

BECK (*Journal of the American Medical Association*, Dec. 26, 1903) transforms the vascular bulk of a nevus into connective tissue by subcutaneous sutures introduced at several sittings. A thread of catgut is passed in a zigzag manner, first below the skin, then underneath the base of the tumor; then, again, underneath the skin, underneath the tumor, etc., until the tumor mass is included in this continuous suture. The suture is drawn tight and closed at the point of entrance of the needle.

In this manner the circulation is shut off within the tumor, but no gangrene follows, inasmuch as some blood can still reach the parts not included in the suture. The mass of the tumor appears much smaller after the end of a week, and the epidermis over the tumor becomes soft and elastic and grows.

This procedure is repeated until the tumor has been diminished to the smallest possible nodule of connective tissue, and the healthy skin enlarged to the utmost. Then the hard connective tissue masses are excised and the borders united in fine linear union.

This treatment is applicable to all varieties of hemangioma, but in the arterial and mixed varieties it is necessary to ligate the largest afferent vessels. Only in this way is it possible to check the often rapid growth of these tumors.

DYSMENORRHEA—SURGICAL TREATMENT.

Dysmenorrhea, according to PARKE (*Medical News*, December 19, 1903), may be divided into two classes, one curable by dilatation and curettage, the other not, the symptomatology indicating the type for which operative measures promise relief.

The symptom of true obstructive dysmenorrhea is pain with the cramp-like character of labor pains. It may follow an operation or disclose the presence of new growth. The operative treatment of this condition consists, of course, in the removal of the cause. If it be a fibroid, this should be removed if feasible, the cervix amputated if necessary, or a hysterectomy done. When obstruction is due to cancer the disease is usually so far advanced as to be incapable of complete removal, and then the only satisfaction is scraping out the canal. If cicatricial contraction following operation be the cause, dilatation should be done, and curettage is in order, for the endometrium is always diseased under these circumstances.

The small anteflexed uteri are usually under-developed. Dilatation sometimes benefits these cases, but they are not promising ones for cure by this means.

Membranous dysmenorrhea is attended by pain not unlike labor pains, which comes on with the beginning of the menstrual period and continues with increasing severity until the membrane is expelled. It is in this particular an obstructive dysmenorrhea, and its surgical treatment should consist in a wide dilatation, curettage, and the application of pure carbolic acid to the endometrium. This expedient affords relief from the severe pain for a time, and occasionally cures the disease.

Spasmodic dysmenorrhea is characterized by pain, which is cramp-like, and often of great severity, causing the victim

to toss about, sweat, and sometimes vomit or even faint. It is paroxysmal and usually of short duration, but rarely may be prolonged sufficiently to lose this distinctive sign. When severe, it is not localized to the uterus, but fills the whole pelvic zone, and may or may not come and go with the menstrual flow. Recumbent posture does not favorably affect the pain, and patients often express themselves as relieved by alcohol. A fairly large percentage of this class of patients are sterile. Physical examination of these cases, after some years of suffering, will show a somewhat hypertrophied uterus.

The simple operation of dilatation and curettage finds its greatest field for usefulness in this type of cases.

Congestive dysmenorrhea is marked by pain of quite a different character from the preceding. Here it is more or less constant and precedes the flow by some days or a week. It may be simply an exaggeration of the aching that so commonly accompanies menstruation, or be severe enough to confine the patient to bed. It is worse at the beginning and improves toward the end of menstruation. It does not cause tossing about, fainting, or vomiting, and is improved by the recumbent posture. The seat of pain is the pelvic area, but it is so often localized to the region of the left ovary, or both ovaries, as to give rise to the name of ovarian dysmenorrhea. Congestive dysmenorrheas are often dependent on pathological changes in the uterus itself or its appendages, such as chronic metritis or endometritis, retroflexion, fibroid tumors and inflammation, or prolapse of the ovaries and tubes. Congestive dysmenorrheas pure and simple do not require surgical treatment for their cure; but when they are secondary to the conditions above mentioned, some operative measure affords the only substantial relief in our hands. Thus a retroflexed uterus should be not only dilated and curetted, but the organ should be restored to the normal position by an appropriate operation such as shortening the round ligaments or hysterorrhaphy. When diseased appendages are the cause of the pain, its cure may depend on their removal. If fibroid tumors are present, their removal is to be advised, although dilatation and curettage will sometimes greatly ameliorate the condition, and should be tried where consent for the greater operation cannot be obtained.

The above mentioned kinds of dysmenorrhea are sometimes blended, the symptoms of one class predominating over those of the others. Thus there may be a dysmenorrhea partly congestive and partly neuralgic, or spasmodic and congestive.

Ectopic pregnancy is a dysmenorrhea or a condition associated with dysmenorrhea. A characteristic history is as follows: The patient misses one or more periods and may suffer from slight pelvic pain. Suddenly she is seized with severe pelvic pain and metrorrhagia, with perhaps the discharge of membranes. This sometimes continues for days or even weeks, if the patient survives. She thinks it is simply irregular menstruation or perhaps a miscarriage; and not rarely the true nature of the case is overlooked by the physician who does not make the necessary examination. The operative treatment consists in the removal of that appendage which is the seat of the pregnancy.

One should never dilate and curette a uterus whose appendages are known to be diseased, unless at the same time an appropriate operation is done upon the appendages; that is, when a physical examination shows the presence of masses on either side of the uterus or adhesions of that organ, or of the tubes and ovaries.

The operation should be conducted with the same antiseptic care as operations on other parts of the body. After introducing a speculum to retract the perineum, seize the anterior lip of the cervix with a volsella forceps, to draw down the organ and hold it firmly, while the smaller sized Goodell or Walthen dilators are introduced into the uterine canal (using previously, if necessary, a uterine sound to find the direction of the canal). Stretch the canal sufficiently to introduce the larger sized dilator. Continue with this instrument to stretch the canal, either rapidly and in all directions, or more slowly in one direction (Goodell's method), until in a nulliparous woman the blades are three-quarters of an inch apart, or in a parous woman they are as much as an inch or an inch and a quarter apart. The dilated canal will now admit a sharp curette without undue force. It should be grasped firmly by the thumb and fingers so that the amount of force

used can be delicately determined. The whole endometrium is to be carefully scraped until the contact of the instrument with the more substantial underlying muscular structure becomes audible and communicates a distinct thrill to the operator's hand. That part of the endometrium which lines the uppermost part of the cavity is best reached by the curette forceps, an instrument which is a combination of the Gross stone forceps and the postnasal curette forceps. Following this the débris is to be washed out with sterile water through a two-way catheter, or wiped out with dry gauze.

It is to be remembered that in the hands of the most experienced surgeons perforation by the dilators or curette has repeatedly occurred, and in the hands of less experienced operators serious damage to other abdominal viscera has been recorded. It is therefore not to be undertaken without a physical examination to determine the absence of contraindications, and should be done with the greatest attention to antiseptic details, and with judgment and care to avoid accidents.

CHOLECYSTOSTOMY—PERFECT DRAINAGE.

A perfectly satisfactory method of draining the gall-bladder after cholecystostomy has been devised by Cook, who, according to GRAHAM (*American Medicine,* Aug, 1, 1903), has employed it for more than a year. It is really the formation of an artificial gall-bladder.

A drainage-tube having large caliber and walls not easily compressed is fixed at its proximal end in the gall-bladder by a purse-string suture. To the distal end, which projects not more than one and one-half to two inches, there is firmly tied an extra large and extra thick condom or rubber sac. Upon the gauze dressings, which are next applied, is placed this condom or rubber sac. It is then surrounded and covered with cotton. A binder-bandage snugly adjusted retains the whole in position. This artificial bladder may be removed once or twice every twenty-four hours for emptying and cleansing.

Among the many other advantages possessed by this method is the obtaining of bile in a pure state, as it flows from the gall-bladder, permitting its use for experimental work in the laboratory.

DIFFUSE PERITONITIS—TREATMENT.

During the last four years LUND (*Reports of the Boston City Hospital,* 14th series) has operated on thirty-four cases of general peritonitis, four-fifths of this number representing cases in which the greater peritoneal cavity was involved, with a mortality of twenty deaths, or 59 per cent. Most of the cases which died were in very poor condition; no cases were refused operation on account of the desperate condition of the patient. The results on the whole are favorable, and warrant a glance at the treatment in more detail.

Granting the importance of immediately removing the infecting focus, complete removal of all necrotic tissue is indicated whenever possible. A smoldering focus should not be left behind. There should next be a thorough cleansing of the peritoneal cavity, and the placing of it under the most favorable conditions for the subsidence of the infection and return of the organ to a normal condition. For this purpose there should be thorough irrigation of the cavity with decinormal salt solution at a temperature of 110°.

Through a long glass nozzle of large caliber pushed into all the recesses of the cavity several quarts or gallons of the salt solution are introduced. This comes out of the wound with a violent rush, bringing with it fragments that might have produced prolonged suppuration and interference with convalescence. The warmth of the irrigant soothes. As the intestinal coils are not removed shock is avoided from this source. A portion of the fluid remains behind of course, and, being absorbed by the lymphatics, increases the amount of fluid in the vascular system. Another portion of the fluid is taken up at once by the gauze used for drainage, and so starts a current from the abdomen out into the dressings. In this manner aid is rendered in removing any infectious material not washed out. Some loose fibrin may be washed out, but attached portions must be left behind. The occasional washing out of a fecal concretion, which otherwise would have been left behind, is a valuable result of this procedure.

After removal of the infecting focus and of infectious products, gauze drainage should be provided. For the drain-

ing of the pelvis gauze wicks are used, and among them is placed a glass tube passing to the bottom of the pelvis. The principal purpose of the tube, however, is to keep the gauze in position, preventing its entanglement through the movement of the intestines. When the tube is removed at the end of twenty-four hours, it is generally found filled with coagulated fibrin.

Gauze drainage alone is employed for the stump of the appendix, and is generally sufficient for drainage of the right flank.

The gauze drains, if the patient improves, are removed in about four or five days, being slightly loosened on the second and third days, and on the fourth day carefully removed. If removed carefully and slowly, one at a time, an anesthetic usually is not necessary.

Of the various methods of assisting drainage by gravity, slight elevation of the head of the bed appears preferable. The blocks which are ordinarily used to elevate the foot of the bed in fractured femur are employed to raise the bed head about one foot. One or two pillows are also placed beneath the shoulders. Where elevation of the head and shoulders is used the incisions sometimes required in the flank are unnecessary.

In cases of general peritonitis accompanied by distention of the intestines, presenting the appearance of cases of intestinal obstruction, in addition to the measures already outlined, an incision about one inch long is made in the small intestine. The distended coils are drawn outside the abdomen as far as possible, emptied of their contents, and into the lumen is injected two ounces of a saturated solution of Epsom salts. The opening is then closed with a continuous suture of silk or linen thread. After the operation on these patients early attempts are made to move the bowels by enemeta of turpentine, glycerin, or saturated solution of Epsom salts. If these efforts prove futile, the distention of the abdomen increasing, and the patient growing worse, a second enterostomy is done. This procedure consists in opening the abdomen in the median line by a short incision, suturing the first distended coil of small intestine which presents itself to the transversalis fascia, tying in a glass tube connected with a rubber tube, and thus giving the feces a direct opportunity to escape, and allowing the paralyzed intestine to recover itself. In certain desperate cases where death was apparently impending, this procedure has proved effective after operation for diffuse peritonitis. Details of the cases in which this method was followed, and a fuller discussion of the method, can be found in the *Journal of the American Medical Association* for July, 1903.

The foregoing methods, if followed in cases of diffuse peritonitis, should, it is believed, contribute to the lowering of the mortality incident to such cases coming to the attention of the surgeon at a late stage.

GALL-STONE ILEUS.

TUPPER (*Interstate Medical Journal,* November, 1903) reports a case of obstruction of the duodenum due to a large quantity of firmly impacted faceted gall-stones, ranging in size from a split pea to a filbert. Eighteen of the stones were removed through an incision in the anterior wall of the stomach, and quite a number of stones could be felt escaping into the duodenum as the impaction was broken up. The gall-bladder was empty, and firmly adherent to the mass containing the calculi. The inflamed gall-bladder had become adherent to the upper portion of the duodenum just beyond the pylorus, and ulceration occurred, forming a communication between the two cavities; thus liberated, the mass of gall-stones had encroached on the lumen of the intestine until complete occlusion took place. The patient made an uneventful recovery.

The author presents the following conclusions after a study of the reported cases of gall-stone ileus: (1) When intestinal obstruction occurs in patients who have had at any time acute inflammatory trouble in the region of the right hypochondrium, erratic gall-stones are to be considered as a probable factor in the production of obstruction. The probability is increased when the patient is a woman and past middle life. (2) The duodenum is the most frequent avenue of escape for calculi ulcerating from the gall-bladder. The colon is the next in order. The jejunum and the ileum are rarely perforated. Calculi entering the duodenum are generally carried further in the small intestine and arrested in their progress by the gradual diminution in the lumen of

the bowel. (3) Gall-stones ulcerating into the colon rarely cause obstruction, being usually passed readily per rectum. (4) When gall-stones smaller than the lumen of the intestine cause obstruction it is probably because of the so-called decubital irritation and angulation described by Pilcher. (5) Frequently the site of the bowel obstruction can be located approximately by the study of certain symptoms, such as the presence or absence of meteorism and the presence or absence of bile in the feces or vomitus. (6) The lower portion of the small intestine is frequently the site of obstruction caused by lodgment of migrating gall-stones; obstruction of the duodenum below the entrance of the bile-duct is very rare, and obstruction between that point and the pylorus most exceedingly rare, the author's case being the only one on record in which obstruction occurred at this level.

THE TREATMENT OF ENLARGED PROSTATE.

MOULLIN (*Lancet,* Dec. 5, 1903) restricts the use of the catheter in the treatment of prostatic hypertrophy to those cases in which the patient manages to lead a comfortable existence by passing a catheter for himself once, or at the utmost twice, in the twenty-four hours. In case of doubt the catheter should be given a trial first, but if the frequency with which it has to be used increases; if the main features of the case are not so much vesical inability or mechanical obstruction as irritability of the bladder; if the amount of residual urine grows larger; if there is a tendency to cystitis; if attacks of congestion are of frequent occurrence; if there is a valve-like outgrowth at the orifice of the bladder or a conspicuous thickening in the posterior median wall of the urethra; if there is any difficulty in the passage of the catheter; if the introduction of the instrument is liable to cause bleeding; if there is a tendency to the formation of calculi in the postprostatic pouch, or if the specific gravity of the urine steadily falls, it is clear that the use of the catheter does not fulfil the necessary conditions. The sooner this is recognized and some other method of treatment adopted the better for the patient.

In every case in which congestion at the neck of the bladder is a prominent feature constitutional measures, such as rest in bed, hot baths, dieting, and free purgation, must never be omitted. When the congestion is chiefly passive, they are often sufficient of themselves to give relief, and though they are not so beneficial when the congestion depends upon other conditions they are still of great value.

In the cases attended by slight enlargement and much congestion, characterized by great irritability and urgent micturition as prominent features, the Bottini operation is serviceable. The venous plexuses in the submucous and mucous layers and the nerves, which in this region are so excessively sensitive, are divided; and three linear cicatrices are left which contract and distinctly lessen the tendency to subsequent congestion.

Division of the vasa, or rather of the nerves which surround and accompany them, checks to some extent the liability of the prostate to congestive attacks, and so far as these attacks are dependent upon stimuli originating from the testes, it is of some benefit.

Removal of the enlarged gland can be effected either by inducing atrophy by means of some operation upon the testes or the spermatic cord, or by operating upon the enlargement itself.

When the bladder is very small and rigid from repeated attacks of cystitis, and the prostate is very hard and dense, perineal prostatectomy is indicated. Under all other conditions the prostate is best attacked by the suprapubic route. If the operation is to prove successful it resolves itself into the removal of the whole vesical mass, the exploration being then extended down the whole length of the prostatic urethra.

PULMONARY GANGRENE—SURGERY.

Led by his experience in pulmonary gangrene, MCARTHUR (*International Journal of Surgery,* December, 1903) discusses the surgical aspects of this affection. He finds that by medical treatment 80 per cent die, but only 29 per cent if the treatment be surgical.

Great care should be used in selection of cases for operation, but when the gangrene is localized and single the most desperate cases should be given a chance, as they frequently recover with drainage.

The *x*-ray is only a valuable aid in

localization. Pulmonary gangrene, of course, gives a picture in its first week or ten days different from that of the succeeding weeks.

When the site of the affection is definitely located the mortality, according to Tuffier, is 29 per cent; when incorrectly located, 60 per cent.

Deeply located gangrenes of the left chest may give *x*-ray shadows confused easily with the cardiac and vessel outlines, hence radiography is of more assistance in the right chest, where, fortunately, most gangrenes occur.

In a circumscribed form of the affection only may surgery hope to be of assistance, hence every effort should be made to determine the extent and character of the lesion with reference to whether there be more than one focus (which is said by Murphy to occur in 15 per cent of cases). If the history furnishes a source for a probable septic embolus, or the inspiration of food products, or a preceding one-sided lobar pneumonia, or a trauma (gunshot, stab), the lesion is more likely to be single than if secondary to a putrid bronchiectasis or lobular pneumonia.

For successful surgery, according to Lejars, the focus must be absolutely circumscribed or confined to an accessible zone, and the condition of the opposite lung must not be irremediable.

The physical signs, as observed by several operators, do not accurately indicate the location of the gangrene, probably because of the better propagation of the sounds along the large air-passages. Physical signs during the early stages are those of infiltration; during the latter stages, those of a cavity.

If the focus can be easily reached it should be drained. In the early operation free incision of the gangrenous mass with no attempt at excision should be made, the aim being to provide prompt exit to septic matter while awaiting the line of demarcation.

The chief aid in diagnosis is by all odds the sputum, never to be forgotten nor confounded with any other expectoration, since it has a most intolerable cadaveric gangrenous odor, worse than and different from any other human product of putrefactive processes. It should be remembered, however, that some cases have been recorded in which there was no communication with the bronchus, hence there was absence of the most characteristic sign of gangrene. Emphasis has been placed on the effect of change of posture producing cough from emptying of a cavity into the bronchus.

The diagnosis and location being made, it remains to choose the method of procedure, which consists in opening the chest wall, finding or making pleural adhesions, and opening the gangrenous area. It is probably advantageous to turn a flap, including three or four ribs, toward the middle line, using the cartilages as the hinge. In the search for pleural adhesions, if the exploring needle be employed to determine the presence or absence of motion between pleura and lung, this instrument should be inserted not more than a centimeter. If there be adhesions there will be no rocking of the needle such as would obtain if its shaft were fixed in the thoracic pleura, while its point was embedded in moving lung. Occasionally this motion may be partial and deceptive. If adhesions are absent, they may be induced by circular suture.

The gangrenous cavity can best be opened by the Paquelin point, as the walls of the opening thus made are protected by the eschar against extension of the gangrene. Entrance to the cavity will become immediately manifest by the smoke of the Paquelin being inhaled and exhaled with each respiration, as well as by the escape of putrid contents. The opening should be large enough to provide free drainage, and even packing of the cavity. Opening the pleural cavity may result in a fatal pleural infection, hence when this complication occurs immediate drainage of the pleural sac has been suggested.

Prior to the act of opening the gangrenous area fresh cut surfaces of the chest wound should be covered with iodoform gauze, which is to remain there until the second dressing, to protect the wound from infection from the discharges. Choice as to drainage with tubes or with gauze should depend upon the tendency to hemorrhage.

Irrigation is in most cases dangerous, always provoking coughing, and is practicable only under intelligent supervision.

As to the closure of the wound, it cannot be too strongly urged that provisional (or no) stitches be put in, the chest wound being closed only when all danger of local infection or burrowing is past.

It appears anatomically possible to separate the pleura from the chest wall, but this is tedious, difficult, and often futile (due to puncture), and therefore not much valuable time should be lost in such efforts. It is likewise apparent that circular suture combined with gauze pressure packing for forty-eight hours is the best means of producing adhesions.

CEREBRAL TUMOR—SURGICAL TREATMENT.

With a view to determining whether or not the results of recent operations on cerebral tumors justify a less conservative attitude toward their operative treatment, WOOLSEY (*American Journal of the Medical Sciences,* December, 1903) collected statistics of 101 cases of cerebral tumors which have been operated upon and reported during the past five years.

In twelve of the cases the tumor was localized in the frontal region, four of which, however, belonged to the motor area. The remaining eight cases were situated in the prefrontal region and presented a characteristic group of diagnostic symptoms psychic in all, and of moral perversion in two. Though Bruns states that disturbance of equilibrium characterizes tumors in both the frontal lobe and the cerebellum, a distinct ataxic gait was present in only one. Three presented local tenderness on pressure or percussion; one, a visible external swelling; two, exophthalmos; and two, a lowered and turned-out eye.

The series of 101 cases includes five tumors in the parietal region, removable by operation, and was localized by symptoms of sensory disturbance. In four of the cases these symptoms included astereognosis, which was also present in the case of some tumors of the motor area, where the region behind it was invaded. In four of the five parietal tumors there were also motor symptoms, usually of moderate development and late appearance, and due to the forward extension of the tumor or its pressure in the course of its growth. Three of the cases also presented ataxia.

Three of the 101 cases were diagnosed and found in the occipital lobe. In all three there was homonymous hemianopsia, which alone, or associated with appearances of optic irritation or hallucination, or soul-blindness, is characteristic of tumor in the occipital lobe. Schuster states that hallucinations and delirium are particularly frequent in occipital lobe tumors. In one case there was also an external tumor to assist in the localization.

In arriving at a diagnosis there must be considered (1) general or pressure symptoms; (2) focal or localizing symptoms. Of the pressure symptoms, headache, choked disk, vomiting, and vertigo are the most important.

Persistent headache is the most constant symptom. Its absence was noted in only eleven of the above 101 cases. It is of slight localizing value since it was confined to the tumor side in only ten cases. In tumors of the frontal lobe, headache, if localized, may be frontal or occipital.

Choked disk is more regularly present and more often pronounced and deeper in a large or rapidly growing tumor, and more often absent in a cystic tumor. Among 50 cases, under forty years of age, in which choked disk was mentioned, it was absent in 26 per cent, as against 44 per cent in cases over forty years of age.

Vomiting was present in 33.3 per cent and vertigo in 22.2 per cent of the cases. Other pressure symptoms noted were slow pulse, deepened respirations, psychic unrest, and general convulsions, but the decisive symptom was choked disk.

Localization of the tumor was made by a study of functional disturbances, by percussion or pressure, and by means of the *x*-ray. Local tenderness on pressure or percussion over the tumor was noted in 21 cases. Two of these were subcortical, and 19 cortical or surface growths. In two cases increased dulness on percussion was noted, and in one case it was the only marked localizing sign. In two cases there was tympanitic resonance, in one of which this symptom and local tenderness were the principal localizing signs. In six cases there were external swellings, three of which were tender on pressure. In five cases in which the *x*-ray was employed, it was negative in one case of glioma of the motor area, while in three cases of sarcomata and one of gumma it was positive.

Of the 101 cases, 12 of the patients died within twenty-four hours, and 26 within three weeks after operation. The mortality was 22.7 per cent in the cases in which an exact localization was made,

and 46 per cent among those inexactly localized. Six of the patients died between three weeks and three months, nine between three months and one year, and three between one and two years, giving a mortality of 43.5 per cent within two years.

In operating for brain tumor, the author raises an osteoplastic flap after cutting through the skull with Doyen's electrical circular saw. Hemorrhage from the scalp is controlled by elastic tubing, drawn tightly about the head around the eyebrows and ears, or when this fails, by overlapping interrupted sutures over the face of the flap, and upon it if necessary. Continued oozing from the cut surface of the bone is controlled by pressure with or without the use of Horsely's powdered wax pressed into the diploe. After turning back the flap of dura and incising the pia around the tumor, the latter, unless disseminated, or unencapsulated, is best shelled out with the finger. Bleeding from the cavity left by the tumor should be controlled as far as possible by ligature, or gentle packing. The author always employs drainage during the first forty-eight hours. Suture of the pericranium and scalp completes the operation.

Absolute cure, or *restitutio in integrum*, is rarely, if ever, to be expected, on account of the necessary damage to the brain substances by the tumor, and the operation of enucleating it. In 16 out of the 101 cases, however, the symptomatic result was so good as to be considered a cure, and in 41 cases the result has been improvement, often so marked as to be nearly a cure.

The author emphasizes the following conclusions: (1) The sphere of operation for cerebral tumors may be, and has been, extended to the prefrontal, parietal, and occipital regions in addition to the motor areas. (2) The prognosis, both immediate and remote, is as good as or even better than in operations for malignant growths in some other locations. (3) Prognosis has improved, with the improvements of localization and operative technique, and with the limitation of the radical operation to cases accurately localized. (4) The palliative operation is strongly indicated to relieve symptoms where localization cannot be accurately made or the tumor cannot be removed. This operation consists of removing the bone from the flap in order to relieve the increased intracranial pressure and the symptoms due to it, and the introduction of a thin plate of celluloid to prevent union of the scalp and dura. The exploratory operation is contraindicated. (5) Practically all circumscribed growths of moderate size are suitable for operation. (6) The osteoplastic method should be employed, and the most rapid and perfect technique adopted which the circumstances will allow.

THE TREATMENT OF TRIFACIAL NEURALGIA.

FRAZIER (*American Journal of the Medical Sciences*, December, 1903) states that probably twenty per cent of cases of trifacial neuralgia are amenable to treatment other than operative.

Non-operative treatment consists, first, in the removal of all predisposing causes, such as malaria, anemia, exhaustion, and peripheral ulceration, such as carious teeth, or antral disease; secondly, in the administration of drugs, of which the most efficacious, especially so in the exhausted or anemic cases, is strychnine. The drug must be administered in heroic doses, and the patient must be kept under close observation, and should be confined to bed. The strychnine is administered hypodermically, once daily, in gradually ascending doses, until at the expiration of two weeks the physiological limit is reached, after which it should not be given oftener than once on alternate days. After the pain has entirely disappeared the drug should be withdrawn gradually. As adjuvants to the treatment, rest is of the utmost importance, and iodide of potash and tincture of the chloride of iron are more or less helpful. If at the expiration of a year, or sooner, if the attacks are very frequent and severe and uncontrollable, under medical treatment, operative treatment should be recommended as the only hope of relief. In the cases in which the pain is restricted to the distribution either of the inferior dental or the infra-orbital branch of the trifacial nerve, the peripheral operation should be chosen, for the following reasons: (1) Because in a certain number of cases it will be followed by absolute recovery; (2) because in a still larger percentage of cases it will be followed at least by a remission for vary-

ing periods of time; and (3) because it is unattended with the risks that accompany the intracranial operation.

An extensive section of the nerve should be removed in order to reduce to a minimum the danger of regeneration. In the cases in which the resected nerve occupies a bony canal, regeneration may be prevented by plugging the canal with some substance, such as silver foil, which the nerve fibers cannot penetrate. When recurrence follows one or more peripheral operations, or when the distribution of the pain is referred to two or more of the branches of the trigeminus, some one of the central operations must be performed. Division of the sensory root possesses the following advantages over other forms of central operations: (1) It should be attended with lower mortality. (2) The serious and troublesome difficulties experienced in the attempts to extract the ganglion are obviated. (3) Its execution is comparatively simple. (4) The integrity of the adjacent structures, particularly the cavernous sinus and sixth nerve, is not endangered.

Animal experiments show that the sensory root does not tend to regenerate.

The operation is performed by the temporal route, a horseshoe-shaped, musculocutaneous flap is reflected, the zygoma is chiseled through at either extremity, and a section of the skull three to four inches in diameter is removed with gouge and rongeur forceps. The dura is cautiously separated from the base of the skull until one of three landmarks appear: the foramen spinosa (through which emerges the middle meningeal artery, which must be carefully avoided or deliberately ligated); the foramen ovale (through which the third branch makes its exit); and the foramen rotundum (through which the second division finds its way out of the skull). During this stage of the operation hemorrhage is severe, but can be controlled by pressure. An incision is now made through the dura propria, between the foramen rotundum and the foramen ovale, and the dura is separated from the upper and posterior surface of the ganglion, thus exposing the sensory root, which is picked up on a short, blunt hook. A small section of the nerve is then removed with blunt, curved scissors. One or two strands of gauze are introduced to provide means of drainage, and the musculocutaneous flap is replaced and sutured.

The author has operated upon three cases by this method, and there has been no recurrence of pain.

TUBERCULOSIS OF THE KNEE-JOINT—OPERATIVE TREATMENT.

MONSARRAT (*Lancet*, Nov. 7, 1903) has operated upon eleven cases of tuberculous disease of the knee-joint during the past three years. In three of the cases there was involvement of the synovial membrane alone; in two cases, of the synovial membrane, capsule, and ligaments; in one case, synovial membrane with ulceration of the cartilage; in two cases, femoral epiphysis alone; in two cases, femur, tibia, capsule, and synovial membrane; and in one case the tibia, patella, synovial membrane, and ulceration of the femoral cartilage and capsule. In six cases the disease was primarily synovial, and in five cases primarily osseous. In three of the cases erasion was required a second time; in one case the limb had to be amputated because of septic infection. The after-treatment was directed toward securing ankylosis of the joint. In five cases there was no flexion; in three others it occurred, but was corrected. All of the patients recovered, and at the present time present no evidences of local tubercular disease.

The author employs a method of exposing the joint which combines the advantage of giving free access to every part and of leaving the extensors practically intact. A long median incision is made commencing half an inch below the tubercle of the tibia and extending upward about three inches above the upper border of the patella. The ligamentum patellæ, the periosteum of the patella, and the extensor aponeurosis are divided exactly in the middle line by an incision the full length of the skin incision. The patella is sawn through in the same direction, and the joint is thus opened. The upper part of the incision is then deepened with scissors, so that the whole of the suprapatella pouch and the quadriceps is split well above it. Perfect access to the upper and lateral limits of the synovial membrane is thus obtained. The joint is then flexed, and at the same time each half of the bisected extensor patella

and ligament is retracted laterally, until the halves of the patella lie outside of the line of the femoral condyles; the tibial surface and the posterior synovial reflexion are thus exposed and dealt with as may be required. When all disease has been removed, the joint is again extended, and the halves of the patella fall together, and may be fixed with a single wire suture. Continuous sutures above and below the patella bring together the halves of the quadriceps and the ligament.

The author thus summarizes the indications for operative interference: (1) Cases of tuberculous foci in the neighborhood of the lower epiphysis of the femur should be operated on as soon as the diagnosis is established. (2) Cases of joint disease by extension from the femur should be operated upon as soon as possible, if this extension is recent, and if not recent, then when the disease does not definitely retrograde after about two months' fixation of the joint. (3) Cases of primary synovial disease should be operated on if after about three months of rest no distinct improvement has taken place.

GENERAL PERITONITIS COMPLICATING SCARLET FEVER.

General peritonitis due to streptococcus infection as a complication of scarlet fever is extremely rare. McCollom (*Boston Medical and Surgical Journal,* Dec. 10, 1903) states that in a clinical experience of over 8000 cases of scarlet fever he has observed a limited number of patients whose symptoms would cause one to think of the possible occurrence of this complication, but the speedy subsidence of all symptoms and the ultimate recovery of the patient would seem to prove that peritonitis could not have existed.

In two instances, however, out of the 8000 cases peritonitis did actually occur. In these cases the attacks of scarlet fever were not specially severe, and there was no cause for anxiety until the occurrence of the abdominal symptoms. The two cases presented in common a series of complications, a late development of the peritoneal symptoms, and an absence of local purulent foci. The family history in one case which recovered suggested a tubercular peritonitis, but the culture from the pus showed streptococcus. The child's temperature began to rise and fluctuate several days before abdominal symptoms were noted. The peritoneal infection was gradual and comparatively painless in its onset. In the other case the onset was acute, suggesting sudden intestinal obstruction and rendering an operation imperative, in spite of the almost complete suppression of urine.

If the signs of peritoneal infection are slight in degree and extent, palliative measures alone, such as enemata, turpentine stupes, and rectal feeding, will suffice. If, however, the pulse steadily rises, and pain, tenderness, and spasm increase, the indication for drainage is imperative. The condition of the kidneys is the most definite contraindication to operation, and whenever possible cocaine should be substituted for ether. The operation should consist of a rapid celiotomy, thorough irrigation with hot salt solution, and drainage. Unless there are definite local symptoms, the incision should be in the middle line. To favor drainage, hot, moist dressings frequently changed are desirable. Salt solution under the breasts and by rectum, and water by mouth if the patient is not vomiting, are all definitely indicated. Stimulation should be free, but alcohol may be contraindicated by the nephritis. Caffeine, strychnine, and digitalis may be used energetically. The prognosis is always grave.

CHRONIC SUPPURATIVE OTITIS—SURGICAL TREATMENT.

White (*Practitioner,* December, 1903) believes that the simplest and safest treatment of chronic suppurative otitis consists of irrigation combined with "otectomy" in cases where obstruction exists. The tympanic membrane should be cut out as completely as possible, especially in the case of children; with the membrane it is nearly always advisable to remove the malleus, and in some cases the incus. Granulations must be scraped out. Some authorities appear to regard granulations as a safeguard, but the author nearly always found them diseased in these cases, and finds a much surer safeguard in antiseptics. After the operation the ear is well irrigated with an antiseptic solution, and treated lightly with a dusting powder.

The operation gave rise to very little disturbance in the majority of the thirteen

cases on which the author has operated, except temporary facial paresis, which occurred twice. There had been in most cases a remarkable absence of severe pain, especially in the cases that had previously undergone a course of irrigation. In several cases the operation gave great and immediate relief to pain. In no case was there any marked diminution in hearing, and in some the hearing was certainly improved. The operation renders possible efficient irrigation of the diseased cavities. The cases operated upon support the belief that chronic suppurative otitis is generally curable by treatment through the meatus, and that such cases should not be allowed, through neglect, to go from bad to worse, nor subjected unnecessarily to the severe ordeal of a so-called radical operation.

Reviews.

THE MATERIA MEDICA OF INDIA AND THEIR THERAPEUTICS. By R. N. Khory and N. N. Katrak. Bombay: The Caxton Works, 1903.

This is an exhaustive work in two volumes of about 800 pages each, and is without doubt a very valuable contribution to our knowledge of East Indian drugs, and of other remedial measures as well. The work does not deal solely with drugs which are native to India, but includes most of those which are commonly employed by practitioners in other portions of the world, such, for example, as colchicum, quercus alba, the various pines and balsams, and such distinctly local drugs as echinacea angustifolia. We have examined what the authors have to say in regard to the therapeutics of most of the preparations which they consider, and find that their advice is valuable. It is not by any means comprehensive, and is more of the nature of the information given in a dispensatory than in a book on therapeutics. At the end of the second volume is an appendix in which the drugs are classified according to their physiological influence, and at the close of each volume an exhaustive therapeutic glossary is also added which does not refer to definite pages, but which gives suggestions as to the drugs which may be employed in various cases of disease. Without doubt the book will prove of value to those for whom it is prepared, and no library which seeks to be complete in the literature of this subject can afford to be without it.

A SYSTEM OF PHYSIOLOGIC THERAPEUTICS. Edited by Solomon Solis Cohen, A.M., M.D. Volume VII: Mechano-Therapy and Physical Education and Exercise and Physical Education by Muscular Exercise.
Philadelphia: P. Blakiston's Son & Co., 1904.

Volume VII of Dr. Cohen's well known system of Physiologic Therapeutics is written in large part by Dr. John K. Mitchell, who deals with the subjects just mentioned in the title. His article is copiously illustrated by photographs which indicate the motions which should be made in the carrying out of these therapeutic measures. Dr. Mitchell's portion of the work covers 220 pages, and is followed by that upon physical education by muscular exercise by Dr. L. H. Gulick, of New York. He considers the subject of exercise and development, the materia gymnastica, sports, games, and systems of gymnastics. The book closes with addenda which cover more than one hundred pages, and which are devoted to orthopedic apparatus, which is discussed by Dr. J. K. Young; correct methods in orthopedic surgery, by Dr. H. A. Wilson; and another upon physical methods in ophthalmic therapeutics, by Dr. W. L. Pyle.

We have more than once pointed out that this system possesses a very distinct value, not only because the material which it contains is excellent, but more still because it serves to impress upon the profession the fact that remedial measures other than drugs are always better than any other plan of treatment if they can possibly be employed. We fear that physicians in general will not take the trouble to peruse this book to the extent that its contents deserve, and to the extent which will be of value to them in their daily work. If they do not it will be their loss, for both the editor and his collaborators have prepared a volume which well deserves their attention.

A PRACTICAL TREATISE ON NERVOUS DISEASES FOR THE MEDICAL STUDENT AND GENERAL PRACTITIONER. By F. Savary Pearce, M.D.
New York and London: D. Appleton & Co., 1904.

Dr. Pearce, the Professor of Nervous and Mental Diseases in the Medico-Chir-

urgical College of Philadelphia, has provided us with a small handbook on Nervous Diseases covering less than four hundred pages, and designed as stated in its title "For the Use of Practitioners and Students." The first four chapters of the book, which cover 114 pages, are devoted to such general considerations as the anatomy and physiology of the nervous system, its general pathology, the general symptoms, and methods of examination, including nomenclature in nervous diseases, with final chapters upon general therapeutics, the prevention of nervous disease, and the acquirement of nervous health. The remaining pages of the book deal with the disorders of the nervous system, diseases of the cranial nerves, the peripheral and spinal nerves, the membranes of the brain; the brain and spinal cord; general and functional nervous disease, trophic disorders, intoxications and general paresis. An appendix of some twenty pages is devoted to disorders of sleep, to "details" and a formulary. It is evident, therefore, that the book cannot be in any sense exhaustive, nor does it, so far as we know, attempt to be such. Most of the illustrations which it contains are excellent. Some of them are well known to medical readers, but many of them are from the writer's own wards. Most of these show what they are intended to show, but some do not, as for example Fig. 29, which is supposed to show wrist- and toe-drop following typhoid fever. Again, Fig. 70 does not show the skullcap but rather the membranes of the brain after its removal, if we interpret it correctly. The list of prescriptions at the end of the volume is too limited to be of very great value to the student.

DISEASES OF THE EYE. By L. Webster Fox, A.M., M.D. With five colored plates and two hundred and ninety-six illustrations in the text. New York and London: D. Appleton & Co., 1904.

According to the preface, this book is the outgrowth of a series of lectures delivered by the author at the Medico-Chirurgical College and Hospital in Philadelphia during the last ten years, and we think the students of that institution are much to be congratulated upon the thoroughness with which they have been taught the subject of ophthalmology. Beginning with a chapter on the development and anatomy of the eye, the author takes up the various external diseases, as well as those which implicate the deeper structures—that is, the choroid, the retina, the optic nerve, etc.—and considers in detail affections of the orbit, refraction, and the anomalies of the external ocular muscles. A chapter on the relation of ocular affections to general disease and one on the pupil in health and disease have been incorporated, always most acceptable additions to text-books on ophthalmology. A chapter on the use of Roentgen rays in locating foreign bodies in the eye finds place.

The book is freely illustrated, many of the drawings and illustrations being borrowed; others are from cases in the author's practice. It is a pity that proper credit for a number of the borrowed figures is not given, either with the legends or in the list of illustrations at the beginning of the book. Doubtless these omissions will be corrected in future editions. There are one or two curious blunders in connection with these cuts. For example, Fig. 119 is described as illustrating retrobulbar neuritis and credited to Fuchs. It is, however, the well known diagram from Pagenstecher and Genth's Atlas of the Pathological Anatomy of the Eye, and depicts not retrobulbar neuritis, but exactly the opposite condition, namely, intraocular neuritis with the distention of the optic nerve sheath which sometimes accompanies it. So, too, in the diagrams of the normal visual fields in glaucoma, taken from Haab's work, the external limits of the field are labeled "black." The lines of course refer to the ordinary dimensions of the field for form or white.

It seems to the reviewer that there is a surprising omission in the description of diseases of the conjunctiva, namely, the failure to describe as a distinct disease acute contagious conjunctivitis, and the bacteriological investigations in connection with this affection. Indeed, throughout the book this aspect of the subjects is defective. Naturally the operative side of ophthalmology receives very full consideration, and there are excellent descriptions of operations suited to such conditions as ptosis, ectropion, entropion, cataract, and the like. The subject of albuminuric retinitis receives very full consideration. The surprising statement is made that in twenty-three patients with

recurring subconjunctival hemorrhages, urinary examinations proved negative, and the author concludes that these extravasations, while they may be premonitory symptoms of nephritis, are not associated conditions. This undoubtedly may be true, but that subconjunctival hemorrhages also accompany many of the stages of chronic nephritis is equally true. A special type of retinitis is attributed to albumosuria.

The book contains an appendix, with illustrations of instruments, a number of very useful formulas, and a glossary. Some of the words are defined, to put it mildly, somewhat oddly: for example, glaucoma—"a disease of the eye characterized by a greenish opaque appearance behind the pupil;" astigmatism—"defect in which light rays are not brought to a proper focus by the unaided eye."

We have no doubt that Dr. Fox's book will meet with a cordial reception and be especially welcome to those whom he has taught. He has not hesitated to give definitely his own views on most of the subjects which he discusses, and this is a feature of the book much to be commended.

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries, and Improvements in the Medical and Surgical Sciences. Edited by H. A. Hare, M.D., Assisted by H. R. M. Landis, M.D. March 1, 1904.
Philadelphia and New York: Lea Brothers & Co, 1904.

With this issue of Progressive Medicine a change has been made in the method of publication. It still appears quarterly, but has been reduced in price from ten dollars to six dollars a year, and it appears in a paper cover instead of the binding which has been utilized heretofore. This reduction in price is due to the fact that a large number of the profession who do not feel able to pay ten dollars for any publication might have in their hands this excellent summary of current medical literature, prepared by the distinguished gentlemen who make up its staff of collaborators, among whom may be mentioned Professor Belfield of Chicago, Professor Bradford of London, Professor Clark of Philadelphia, Professor Randolph of Baltimore, and others. The present volume contains, as did the volume for 1903 of the same date, articles upon the surgery of the head, neck, and thorax, by Dr. Charles H. Frazier, Professor of Clinical Surgery in the University of Pennsylvania; one upon the infectious diseases, including acute rheumatism, croupous pneumonia, and influenza, by Robert P. Preble, Professor of Medicine in the Northwestern Medical School; one on diseases of children, by Dr. Floyd M. Crandall, the Adjunct Professor of Pediatrics in the New York Polyclinic Hospital; another upon laryngology and rhinology, by Dr. Charles P. Grayson, lecturer on these subjects in the University of Pennsylvania; and one upon Otology, by Dr. Robert L. Randolph, the Assistant Professor of Ophthalmology and Otology in the Johns Hopkins University. These contributions are not abstracts of original articles from various journals; they are stories of the progress made in these departments, stories which are told by the collaborators, and which are embellished by a free expression of their views as to the best methods which should be employed, and as to the results which should be considered as a permanent gain to diagnosis and treatment. In the article upon diseases of the head, neck, and thorax, careful consideration is given to the subject of injuries and surgical diseases of these parts, and in that upon the infectious diseases most interesting information is given in regard to pneumonia, diphtheria, scarlet fever, and the other infectious diseases which at this season engage the attention of every physician. Dr. Crandall's article upon diseases of children opens with a discussion of mortality in early life, and this is followed by others upon the maladies of childhood as they are met with by the general practitioner. The general physician will find many valuable hints as to treatment in the articles of Drs. Grayson and Randolph. The large clinical opportunities of the collaborators of Progressive Medicine make their opinions in regard to these subjects of more than ordinary value.

A HANDBOOK OF OPHTHALMIC SCIENCE AND PRACTICE. By Henry E. Juler, F.R.C.S. With illustrations. Third Edition, Revised and Enlarged.
Philadelphia: Lea Brothers & Co., 1904.

It is just twenty years since the first edition of Mr. Juler's book appeared, and it at once obtained a favorable reception

in England and America, being particularly noteworthy on account of the numerous colored illustrations, both of external diseases of the eye and of the fundus oculi. This third edition has been brought up to date, and all of the favorable comments that have previously been made may now be repeated with emphasis. It is essentially a practical book written for the needs of the student and the ophthalmic practitioner, liberally and well illustrated, conservative in tone, safe in practice, excellent in advice. A very happy portion of the volume is contained in the appendices, and the excellent plates giving the normal appearance of the various structures of the eye under the microscope, as well as many of their pathological deviations, deserve full commendation. The chapter on the Refraction of the Eye is written conjointly with Mr. John Griffiths, and is an excellent practical exposition of this subject, not excessively burdened with unnecessary mathematical formulæ. The book may be heartily recommended.

ESSENTIALS OF PELVIC DIAGNOSIS. With Illustrative Cases. By E. Stanmore Bishop, F.R.C.S. Eng. Appendix on Examination of Blood, etc., by Chas. H. Melland, M.H. (Lond.), M.R.C.P.
New York: William Wood & Co., 1903.

This book is constructed on a somewhat new plan—*i.e.*, the writer does not assume that the one who sees it knows the disease, but simply that he is familiar with the most prominent symptoms. From the symptoms the manual is so arranged that the observer may logically deduce the diagnosis. Thus, there are a series of numbered paragraphs, entitled lines of diagnosis, in which the more broadly marked and more general dividing symptoms are given in italics, and the whole in considerable detail. There are also diagnostic tables, in which a more comprehensive view may be taken of the entire class, group, or section of the pathological conditions to which the case belongs. Lastly, there is a list of illustrative cases, taken from actual practice.

The book closes with an appendix giving methods of examining the blood, and the technique for examination for tubercle bacilli and gonococci.

The introductory chapters are devoted to methods of diagnosis, the use of the hand, the position of the patients for the purposes of diagnosis, the use of instruments for diagnosis, and pain as a factor in the diagnosis.

In the second part the true system is elaborated by which one accustomed to working out details may at least approximate the diagnosis of all affections of the perineum, external genitals and inguinal region, abdominal wall, vagina, rectum, bladder, and the prostate. There is a part devoted to swellings in the pelvis, felt bimanually, and one to swellings of pelvic origin which have developed into the abdomen.

The diagnostic tables are extremely alluring, and are likely to prove serviceable.

ARTERIA UTERINA OVARICA. The Utero-Ovarian Artery, or the Genital Vascular Circle. Anatomy and Physiology, with the Application in Diagnosis and Surgical Intervention. By Byron Robinson, B.S., M.D.
Chicago: E. H. Colegrove.

The reader is prepared for something unusual in glancing over this work by the large number of extraordinary illustrations, which demonstrate the general vascular circulation of, not only man, but of the guinea-pig, dog, cat, rabbit, leopard, cow, sheep, pig, horse, monkey, and, greatest treat of all, of the golden-faced baboon.

Although the book is almost purely an anatomical study, in its logical inferences it presents so many points of practical importance that it should be carefully studied, at least by the practicing gynecologist. Indeed, the author has in many instances pointed out the application of the facts he has taken such pains to demonstrate as helps in diagnosis and in deciding for or against surgical intervention.

Correspondence.

LONDON LETTER.

BY GEORGE F. STILL, M.A., M.D., F.R.C.P.

It seems but a few years since the pancreas was practically "outside the range of practical politics" so far as diagnosis or treatment was concerned. Nowadays its diseases are not only diagnosed with some approach to certainty, but are even within the reach of surgery; almost every

month brings some fresh information or experience in diseases of the pancreas. Dr. Sidney Phillips reported at the Clinical Society this month the case of a woman aged twenty-six who had complained of pain in the epigastrium for nearly four months, but not of such a character as to suggest biliary colic. Two months after the beginning of the pain jaundice appeared; laparotomy was then done, and showed that the pancreas was greatly enlarged, apparently from chronic inflammation. Two months later sugar was found to be present in the urine, and although the jaundice subsequently disappeared the glycosuria continued, and the woman died of diabetic coma nine months after the operation. The jaundice in these cases seems to be due to pressure of the inflamed pancreas on the common bile-duct where it joins the pancreatic duct and opens into the duodenum.

In most of these cases of chronic pancreatitis the gall-bladder is distended, and Mr. L. A. Bidwell said that in his opinion it is always wise to drain the gall-bladder for two or three weeks after the operation. Glycosuria certainly need not occur; in four cases under his care no such complication had occurred after the operation.

Almost simultaneously with this case come records from provincial hospitals of two cases of pancreatic hemorrhage, both in women, and both with a sudden onset with severe pain in the epigastrium, vomiting, and collapse. In both cases laparotomy was performed. In one which proved fatal a portion of the pancreas was removed; in the other a simple incision was made into the pancreas to relieve tension, and the patient made a good recovery. From Manchester also comes a record of a pancreatic cyst in a man aged forty-five years not only diagnosed, but successfully drained; the patient made a perfect recovery.

The acute hemorrhagic pancreatitis to which I have referred evidently must be considered in every case where the possibility of perforated gastric ulcer presents itself, for in both the cases mentioned here the symptoms had been attributed to perforation of a gastric ulcer, and conversely the mistake has been made of supposing acute pancreatitis to be present where the event showed perforated gastric ulcer.

This latter condition, urgent as it is, and calling for immediate operation, is by no means easy of diagnosis. In one case recently reported the patient, in spite of a sudden onset of abdominal pain, showed symptoms which suggested typhoid fever, and it was not until twelve days after the perforation that operation was performed and a localized abscess opened which was seen to be connected with a perforation of the stomach.

At a recent meeting of the Medical Society of London another condition was mentioned as closely simulating perforation of a gastric ulcer, namely, rupture of a tubal gestation. Dr. Handfield Jones said that in such cases little help could be obtained from the menstrual history, and pelvic examination might not solve the difficulty; the pain is often generalized over the abdomen, and the only way to be certain of the diagnosis is to perform laparotomy. As Dr. Heywood Smith pointed out, however, in a ruptured tubal gestation the condition of the breasts may assist the diagnosis.

The importance of examining the pelvic organs in suspected abdominal disease was emphasized at this meeting: for instance, severe nausea and vomiting might be cured in some cases by the treatment of metritis; pelvic adhesions might be responsible for troublesome constipation and nausea. But on the other hand a case was mentioned in which removal of the ovaries had been proposed for the cure of severe dysmenorrhea, but the symptoms subsided with the simple provision of spectacles for an error of refraction in the patient.

At the Pathological Society a discussion on arteriosclerosis was recently opened by Dr. F. D. Savill, who described particularly an overgrowth of the muscular wall of the arteries, hypermyotrophy as he called it, which he considers to be part of a condition common in elderly people, with high arterial tension, and occurring often quite independently of any disease in the kidneys, which might indeed be perfectly healthy. Prof. Clifford Allbutt, referring to the clinical aspect of this condition, said that one of its most satisfactory features is its amenability to treatment. Repletion, relative or positive—*i.e.*, tempered or untempered by air and exercise—is the chief etiological factor in many cases, and careful alterative treat-

ment with attention to the *primæ viæ* might do much to relieve them. Whilst this excessive arterial tension with its consequent increase of "expenditure in labor and plant" is most commonly found in old age, the watchful physician may detect it occasionally in young persons, especially in boys. Dr. Pavy also was of opinion that much might be done by careful dieting and medication in such cases to restore the circulation to its normal condition.

The treatment of gonorrheal conjunctivitis was under discussion recently at the Ophthalmological Society. A case was reported in which in addition to perchloride of mercury and protargol (five-per-cent), a three-per-cent solution of hydrogen peroxide was dropped into the eye every four hours. When this latter instillation was omitted ulceration of the cornea commenced; the peroxide was then used again, and the corneal ulcer quickly healed. The conjunctivitis was certainly cured with unusual rapidity, and it seemed probable the excellent recovery was due to the peroxide. Mr. Tweedy said that he had used hydrogen peroxide with good results in hypopyon ulcer. From the Moorfields Hospital, however, came an adverse opinion on the value of the drug, for Mr. Holmes Spicer said that he had found in a large number of cases of purulent ophthalmia that treatment with silver nitrate gave better results than the use of hydrogen peroxide alone. At one time the peroxide was used there for all cases of ophthalmia purulent in character, but it had now been given up. Protargol, it was stated, is of very little use if of weaker strength than 20 per cent.

The recent Lettsomian Lectures were full of practical interest. Mr. Lockwood took for his text "Aseptic Surgery." He spoke of the difficulty in finding an ideal chemical antiseptic; it was, he said, "as arduous as the quest of the Holy Grail." The fact that one chemical is better than another in the laboratory does not prove that it is so also in the operating theater. To take one point only into consideration, an antiseptic which suits one surgeon might not suit another, simply because in the latter case it keeps his skin in a continual state of irritation, whilst in the former it had no irritating action whatever on his skin. He himself had in this way been troubled when using sublimate; but now in using the biniodide of mercury he is perfectly free from discomfort. But even on the main point, the antiseptic value of various chemicals, there is great difference of opinion, and laboratory results are hardly comparable with surgical experience. Even when according to laboratory results a chemical is a poor antiseptic, it might nevertheless be of great value in practice. This is the case with iodoform, which is an exceedingly feeble antiseptic, but for all that is very valuable for wounds about the rectum and in some tubercular ulcerations. Different kinds of infection require different kinds of antiseptic: for instance, the bladder and urethra may require nitrate of silver, and this may be increased in strength until it reaches, as in one case quoted, as much as one grain to the ounce; in the same case 1 in 10,000 of sublimate caused intense pain. In the treatment of fetid abscesses in connection with the appendix, or with the middle ear, a five-per-cent solution of hydrogen peroxide is found most effectual. For the surgeon's hands during operation Mr. Lockwood recommends a lotion of biniodide of mercury dissolved in methylated spirit (1 in 500) 75 parts, with water 25 parts.

Next week an event is to take place which will be hailed with satisfaction by every medical alumnus of Cambridge University. The King and Queen have promised to open the new buildings of the Medical School of that university. To those of us who studied in the old buildings, and learnt our anatomy in the old shed which served as a dissecting-room, our alma mater must seem at last to have clothed herself in suitable apparel. Certainly the old buildings were utterly unworthy of one of the oldest universities in the world.

As I close this letter one of the most venerable and distinguished members of our profession, Sir Samuel Wilks, is suffering from a serious illness, a gangrenous appendicitis, and according to the latest accounts has not rallied satisfactorily since the operation was performed. A few days ago a well known physician passed away, the physician extraordinary to the King, Sir Edward Sieveking, who was also on the consulting staff of St. Mary's Hospital. Many Scotch gradu-

ates will also be sorry to hear of the untimely death of Dr. Milne Murray, one of the best known gynecologists of Edinburgh.

PARIS LETTER.

By R. H. Turner, M.D. (Paris).

The isolation of tuberculous patients, who are so numerous in the general wards of the Paris hospitals, is a question which is being examined into most carefully at present, and the following conclusions have been voted by a commission under the direction of the Minister of the Interior: All direct relations between tuberculous and non-tuberculous wards are to be forbidden. Special hospitals are to be erected for the former class of patients. It is absolutely forbidden to place a tuberculous patient in the common ward.

The proportion of cures in cancer of the uterus is perhaps somewhat different from what is generally accepted. According to Dr. Lejars, out of 100 cases only 20 are considered to be in a condition to be operated upon, and of these five only are definitely cured by the operation. This is certainly true at the present time, because patients suffering from this disease are generally seen by the practitioner much too late, when the disease is far advanced. The statistics furnished by Flaischlen in the *Centralblatt für Gynäkologie,* and indicating the results obtained in Ruge's clinic in Berlin, are much more hopeful. Out of 48 cases operated by vaginal hysterectomy, 17 are still alive; 12 were operated over ten years ago, and 5 over seven years ago. Three other cases have died from another disease without showing symptoms of a recurrence of the original disease. There were 4 deaths from the operation, and 24 relapses, most of them taking place during the second year.

In a case of typhoid fever which Dr. Albert Robin had in his service at the Beaujon Hospital, venesection was used on account of ataxo-adynamic symptoms, and indications that toxemia and insufficient oxidation were present. The result was good, and seems to tally with what is seen in certain forms of typhoid fever accompanied by metrorrhagia or mild hematemesis.

It is interesting to note the progress that has been made in Professor Pinard's obstetrical service. While he was at Lariboisiere, from 1882 to 1889, there were 12,580 labors with 94 deaths, or 0.74 per cent, 0.39 per cent of which were by septicemia. At the clinique Baudelocque, from 1890 to 1903, there were 31,539 labors with 167 deaths, or about 0.53 per cent of mortality, and 0.22 per cent from infection. Six hundred and thirty-one operations were performed, mostly by Dr. Segond, and there were 35 deaths. These statistics are certainly very encouraging.

At a recent meeting of the Society of Surgery Dr. Lucas Championnière spoke on certain types of fractures of the radius caused by the crank of the automobile. He also showed a radiograph of a direct fracture of the radius caused by the crank striking the radius. There is also another variety of fracture caused by the hand being bent backward by the return of the crank. In the first case the line of fracture is situated in the lower third of the bone; in the other it exists immediately above the styloid process of the bone.

Dr. Plicque has been trying recently silicate of sodium in the treatment of lupus. Night and morning the spot is painted with the following solution:

> Silicate of soda, 20 grammes;
> Sterilized water, 80 grammes.

It is well to add a little fuchsin to modify the whiteness of this preparation. A very small amount, however, should be added. In two cases of lupus of the face of long standing, there was noticeable improvement after six weeks in one case, after a month in the second. A few nodules are left, however, on which it would be interesting to try interstitial injections of silicate of soda.

At a recent meeting of the Society of Dermatology Dr. de Beurmann described a case of epithelioma of the breast, which had increased in size very rapidly. Last August it appeared as a node in the breast of a woman, who was nursing a child, and in two or three months was very much increased in size. It is now no longer movable on the pectoral, and Dr. de Beurmann said he considers the best course to pursue is a complete excision followed by radiotherapy. Dr. Brocq remarked, on being questioned by Dr.

Leredde, that arsenic might be tried in injections, but it was hard to say what would be the result. Dr. Jullien also proposed the use of quinine as recommended by Dr. Jaboulay. Ulceration plays a certain rôle, as tumors which are not infected do not seem to progress so rapidly. At the same meeting Dr. Balzer spoke against injections with vaselin, which are so often followed by nodules. Dr. Milian insisted upon the fact that when injections are really made into muscle with oil, for instance, they never cause any nodules. Dr. Hallopeau described a case of gummatous ulceration, which was through a mistake treated by the application of compresses impregnated with a 5:1000 solution of corrosive sublimate. The result after three weeks of this treatment was most favorable.

Dr. Alfred Martinet has recently written in the *Presse Médicale* an article on the best method of administering antipyrin. The usual method is that by capsules, which is by far the worst, as this drug is quite irritating for the mucous membrane of the stomach. It is usually given this way because it is cheaper, but it would be far preferable to have a solution. It is well to give some bicarbonate of soda with the antipyrin, or better still the following:

Antipyrin, 2 grammes;
Bicarbonate of soda, 1 gramme;
Distilled water, 60 grammes.

A little cognac or syrup of bitter oranges may also be added. A tablespoonful contains 50 centigrammes of antipyrin. Antipyrin should always be given outside the periods of digestion—that is to say, half an hour before or an hour and a half afterward. As for hypodermic injections of antipyrin, they are apt in many cases to cause sphacelus if too concentrated. Even with 1-to-20 solutions the danger is not absolutely put aside. A solution of antipyrin 2 or 5 for 10 of water is excellent in certain forms of epistaxis, in old people with a high tension pulse. As an ointment it is useful in anal fissures:

Chlorhydrate of cocaine, 0.5 centigramme;
Antipyrin,
Oxide of zinc, āā 2 grammes;
Lanolin,
Vaselin, āā 10 grammes.

For external use.

Antipyrin should never be given in large doses at first, the maximum amount the first time being 50 centigrammes.

At a meeting of the Society of Therapeutics, held on the 10th of February, Dr. Bardet communicated the observation of a patient of Drs. La Neele and Cornicres treated by Marmorek's antituberculous serum. The case was that of a woman thirty-four years old, who was affected with acute tuberculosis of both lungs, and received forty-seven injections, making a total of 720 grammes of serum. The symptoms observed—râles, fever, dyspnea, cough, abundant expectoration—have gradually disappeared. At first there was a large number of Koch's bacilli, but these grew less frequent, and now they can only be found in one preparation out of three. No clinical symptoms of the disease are left, and the physicians who have been watching the patient consider that the lungs have been restored to their original condition.

Drs. Klein and Jacobsohn presented at the same meeting the observation of a patient thirty-one years old who was treated by the injection of 155 cubic centimeters of this serum. Last August there were pronounced signs of infiltration, and abundant expectoration. The patient is now so much better that he considers himself cured. The only symptom seen at present is furnished by a few crackling sounds at the summit of the left lung.

Dr. Créquy reported the treatment he had used in a case of cirrhosis of the liver. He was consulted in September of 1902 by a patient suffering from this disease, to whom he gave the usual treatment—milk, diuretics, iodine—and he was obliged to make twelve punctures, 8 to 10 liters being removed each time. In 1903 the patient caught the influenza, and grew much worse. The following treatment was then carried out: Milk and a mild diet. Every day he was given a gramme of hepatic extract. He also received every day 50 centigrammes of nitrate of potassium in an infusion of dog's-grass. The general condition improved rapidly, the hemorrhages ceased, the edema and ascites disappeared. The patient has been able to take up his occupation during the last four months.

Notes and Queries.

PREANESTHETIC SURGERY.

The following historical note from the *British Medical Journal* of February 6, 1903, is of interest:

Among the "human documents" concerning the discovery of anesthesia there is none of more thrilling interest than a letter in which Dr. George Wilson gives Sir James Simpson an account of his sufferings when undergoing amputation of a limb in the days before chloroform or ether. Speaking of the operation he says: "Of the agony it occasioned I will say nothing. Suffering so great as I underwent cannot be expressed in words. . . . The particular pangs are now forgotten; but the black whirlwind of emotion, the horror of great darkness, and the sense of desertion by God and man, bordering close upon despair, which swept through my mind and overwhelmed my heart, I can never forget." Worse than the operation itself was the period of waiting for it, when Dr. Wilson says the patient felt like a condemned criminal preparing for execution. The full text of the letter may be read in the *Practitioner* for October, 1896. With it may be compared the following description of an amputation before the days of anesthesia, unearthed by a writer in the *New York Medical Journal* from a book by Dr. W. Beach of New York, which was published in the early forties. It should be stated that the description is quoted by Beach from a newspaper (bearing date July 21, 1841), but evidently he did not think it overdrawn:

"The next (case) was an interesting one of white swelling, for which the thigh was to be amputated. The patient was a youth about 15, pale, thin, but calm and firm. One professor felt for the femoral artery, had the leg held up for a few moments to ensure the saving of blood, the compress part of the tourniquet was placed upon the artey, and the leg held by an assistant; the white swelling was frightful. A little wine was given to the lad; he was pale, but resolute; his father supported his head and left hand; a second professor took the long, glittering knife, felt for the bone, thrust in the knife carefully but rapidly; the boy screamed terribly; the tears ran down the father's cheeks. The first cut from the inside was completed, and the bloody blade of the knife issued from the quivering wound; the blood gushed by the pint; the sight was sickening; the screams were terrific; the operator calm. Again the knife was thrust in under the bone; the terrific screaming was renewed; one or two picked up their hats to leave; scream on scream—and again the bloody blade of the knife was issued from the wound, and was laid aside. The flesh quivered, and the boy cried agonizedly, 'Oh, father! father! father! Oh, mercy, mercy!' The flesh was thrust back with a small piece of wet linen, the divided ends of the quivering muscles were stopped from blood with a sponge, the saw glistened in the hands of the operator; the father turned as pale as death; the boy's eyes fastened on the instrument with glazed agony—grate—crush—once—twice—and the useless limb, from the toes to the centre of the thigh, was quickly dropped into the tub under the table. At this moment the father's eyes closed, his child's hand dropped from his grasp, and he reeled from the table, and fell senseless on the floor. The arteries were taken up, cold compresses only were applied; one or two stitches in the flesh, one or two more screams, and the boy was taken into an adjoining room and laid on a bed. The whole took less time than the details have occupied in writing."

Beach, who, it must be remembered, held a brief against operation for white swelling, says that such displays of surgical art are fraught with alarming consequences, and by way of proof calls an unnamed poet as witness to the fact that "Scenes of blood the human feelings sear." It may be admitted that although preanesthetic surgery did not necessarily harden the hearts of surgeons, it could hardly have tended to soften their manners. The sight of an operation nearly made Simpson himself abandon the profession. Among the incalculable gains which anesthesia has brought to surgery, not the least is that it has made the practice of the art possible to men of delicate sympathy, who could not brace their nerves to the infliction even of salutary suffering on a sentient fellow creature.

ENJOY